

S-9 Results

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SAF01: Comment on any safety related issues you wish to address.

Comment Total Responses 194 (Avg.) 3.9

The biggest safety related concern would be the availability of stands tall enough to perform required maintenance on nacelles. 2

Cannot clear the aircraft into the Landing Zone from the left window. Too small and the troop seat interferes. Also the stress on the Neck and Back become a human factors issue. 2

If there are 24 troops with packs and weapons the aircraft is too packed and EGRESS could be impossible for the troops. There is no room for the c/c to get to anyone to help them, and the lookout doctrine is pretty much not there during forward flight. You only have enough room for one crew member. 2

Upper cabin door window is too small. It is extremely difficult to clear the aircraft right when in airplane mode. 2

The following information taken from previous questions are all related to Safety 2

1. This mission was very ineffective against Fixed/Rotary Wing Threats or any threat that will involve lookout doctrine. The MV-22 doesn't provide more than 180 degrees of "Realistic FOV" and that is only from the cockpit. The term "Realistic FOV" is used because the only window provided for the crew in the cabin is approximately four inches in diameter, the crewdoor opening (Emergency pressure relieve window). By design the other windows in the cabin serve no purpose for lookout doctrine. They only provide day time natural lighting in the cabin. The forward left seat which is utilized for clearance is the troop commander seat, the two cabin seats which are used are troop seats. The only clearance for the crewmember is the crew door. The MOTT crewchiefs have been utilizing the troop commander seat window for clearance, however the nacelle in HELO, Conversion, and APLN mode blocks the left side clearance. The two troop seats are used as well, however, there is a blind spot from approximately 4:30 to 7:30. When attempting to clear high level traffic it is impossible because the top of the crew seat impedes the bottom portion of the window stopping the crewmember from kneeling down and trying to look up. On night vision goggles the crewmember FOV goes from 188 degrees down to 40 degrees FOV (Field Of View) making lookout doctrine even more ineffective. If the aircraft is used to carry troops with their gear as design the crewmember will only have his four inch window on the right crewdoor to make clearance calls from. The MV22 has downward stroking crash attenuating seats which does not allow troops to place gear under the seats. This blocks the entire cabin so that the crewmember could not get to the cabin windows for clearance. The ramp was utilized using a cargo strap for added safety. This was not a viable solution because of the empennage block the high level clearance and excessive "G" forces was placed on crewmember laying down.

By the doctrines and principles of Defensive Manuevering the MV22 will easily be defeated because it would be clear to any aggressor that the crew does not have good lookout.

This was a very frustrating flight because of the crewchiefs inability to provide the pilots with vital information regarding the aggressors location. Situational Awareness and Crew Coordination was dramatically low because of the inability to provide constant updates for the wingman and aggressors.

Poor FOV and excessive movement to try to clear aircraft.

Poor performance of the ECS, cabin is very hot and has no air circulation

Excessive G's from defensive maneuvering cause stomach sickness, light headness, and vomiting

Lack of ability to hear aircraft crew-alerts and the threat alerts reduces situational awareness.

Constantly standing while attempting to clear is very uncomfortable on long flights

There are no hand-holds in the cabin, this causes crewmember to get bounced around in the cabin. Several seats have been ripped by crewmembers utilizing seats as hand-holds.

Excessive debris coming in the cabin is abrasive to the face and skin during landings.

Coanda's not working makes cabin very hot during landings and while on the deck.

Landing in the desert can be detrimental to your health... 2

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Upper cabin door window is too small. It is extremely difficult to clear the aircraft right when in airplane mode. 2

we need more windows in the back of this aircraft 2

Crew member needs to be used in the crew. 2

ECS, causes extreme fatigue and discomfort.

Crewdoor is unsafe, too short with no place to hold on to.

Inadequate FOV causes strain on eyes and headaches.

Aircraft is very dangerous in extreme cold weather. I on ground will knock crewmember of feet, rotorwash sends ICE and Debris towards crewmember, crewmember is literally freezing cold

Cannot clear the aircraft into the landing zone from the left window with NVG's. The window is too small and the troop seat takes up half the window. 2

No jump lights. Need 3 sets : 1 and 2 on the fuselage back by the ramp, visible to both JM and jumpers, #3 on trailing edge of crew door on right side. Our unit is accustomed to adapting, flexing.. A "vanilla" halo team seeing no jump lights might consider that a show stopper. 2

Doing a max rate conversion today, aircraft had TRAPPED FUEL induced. Not an enhancing characteristic. EP cleared it. 2

I have very little confidence in the aircrew's ability to update/align/ or verify for accuracy the navigation solutions provided by the INS'. The default attitude among many in the MOTT is that "I hope they work.." The software apparently has so many bugs in it that even though I can read about system functionality in the NATOPS, I have yet to see a reliable demonstration of the above-mentioned techniques and can rarely tell if it's a software bug or something the system wasn't supposed to be able to do anyway. If this doesn't get unscrewed, it's going to get someone either hurt or at least a flight violation. 2

Field of view : 2

Cannot clear the left side of the aircraft during NVG CAL landing's with a troop sitting in the seat in front of the window. Also with just the back of the troop sitting taking up half the window the observer has to turn his head on a forty five degree angle to attempt to clear the aircraft into the LZ.

With the upper cabin door closed the window is too small to clear the aircraft right

we need more and larger windows in back 2

Upper cabin door window is too small. It is extremely difficult to clear the aircraft right when in airplane mode. 2

Cannot clear the left side of the aircraft during NVG CAL landing's with a troop sitting in the seat in front of the window. Also with just the back of the troop sitting taking up half the window the observer has to turn his head on a forty five degree angle to attempt to clear the aircraft into the LZ.

THE ROTOR WASH AND SAND AND ROCKS COMING IN THROUGH THE CREW DOOR MAKE IT VERY HARD TO SEE AND HARD TO BE UNDERSTOOD OVER ICS. THE ROCKS AND STICKS ARE VERY DANGEROUS WITHOUT ANY PPE TO COVER THE FACE AND NECK. THE EXHAUST ALSO GETS BLOWN IN THE DOOR SOMETIMES AND HAS TO BE WELL OVER 100 DEGREES BY THE TIME IT GETS TO YOU, A COULD GUST CAN BURN YOU AND BURNS YOUR EYES. 2

1. NVD missions are very frustrating and dramatically decrease SA because crewmember can not perform duties as required. The lack of ability to provide rear lookout is a great percentage of the crewmembers responsibilities. 2

2. Abrupt maneuvers can cause injury to crew member if not properly secured in seats with restraint on. If the crewmember is secured in seat he has no value to flight. Again the lookout doctrine, along with abrupt maneuvers are directly related to safety.

Seat belts have a tendency to get hung up on gear and are difficult to hook up and remove while wearing combat equipment. 2

Aircrew was constantly reminded to maintain hold of fire bottles during starts, ship emphasize proper procedures. Positional lights - unable to see & determine whose flying. 2

TRYING TO STAND AND KEEP YOURSELF UPRIGHT WAS DIFFICULT. YOU CAN GRAB THE WRONG THING TO KEEP FROM FALLING IN BACK BECAUSE THERE ARE NO HAND RAILS TO HOLD ON TO. VERY DANGEROUS, ESPECIALLY WITH MORE PEOPLE IN THE BACK OF THE PLANE TO BUMP INTO. 2

The outboard swash plate actuator should be removed because numerous personnel had to work in that area with someone holding the actuator in different positions. This could have been a problem if the actuator fell on someone's hands. 2

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Seats need to be larger and belts need to be longer.	2
The concept/design of the dual-point system does not inspire confidence. The poor reliability of the electronic components of the system and the often erratic indications provided make aircrew highly suspicious of trying dual-point ops with any load of value. When performing hook checks, the advisories posted on the CDU are inconsistent - the HATCH OPEN/HOOK OPEN advisories post and clear in an often confusing method and/or when the hook(s) didn't actually open. The inability to actually test the dual-point system & associated auto jett function is another problem - the MBIT test run by avionics is only as good as the diagnostic characteristics of the test - which no one knows about.	2
Ground run at 100 percent over 30 minutes caused the aircraft parking ramp to light in the area under the nacelle. This area was between concrete slabs that contained tar. These type of areas are very difficult to avoid at New River and are prevelant at many other airfields. The failure of the RADALT on short final is a safety issue. The safety lanyard on the pennants snapped and broke when a load was plance on the pendant. The snapping force of the lanyard could cause serious injury to the aircrewman controlling that pendant. This lanyard need to be longer.	2
Fastrope bar position is too far out from ramp. Requires immediate modification.	2
Unacceptable ECS, Unacceptable FOV, No hand-holds for the crewmember at the crewdoor, excessive rotorwash, excessive amount of time required to daily aircraft, not enough time to attend briefs/debriefs and lack of SA due to limited responsibility in flight are all contributing factors to this rating.	2
Crew door window is to small to effectively clear the aircraft on the right side.	2
FLIR didn't work. We had a turret failure that could not be resolved.	2
Crew door is too small to effectively clear the right side of the aircraft.	2
Visibility- Totally unsat	2
Crew Door- Unreliable, unsafe, cumbersome latches and hold down mechanism.	
Handholds- It's just a matter of time before someone jettisons one of our emergency escape hatches due to NO handholds in A/C.	
Seats- Can be a safety issue if you go down in the water and all of those seat belts are floating around in the cabin when you try to egress.	
ECS- The system will not work to attain a desired temperature, it's only usable for the pilots.	
No relief tube/system- this is a problem for crew and team members.	
ICS- If we can't hear each other then an accident is waiting to happen.	
Attempted several different approach profiles searching for a technique that would allow safe night landings in desert environment. Nothing worked! Flying the FLIR to a hover page landing only works to a runway (when you don't need it) In desert sand, FLIR brownout occurs at about 15ft agl making it a useless tool. External load profiles were flown and filled the cabin with sand through the open cargo hatches. The whole thing sucked! Upon return to KNYL, all six blades were skinned of paint.	2
The V-22 does not have enough power margin to fly away from a less than perfect, high gross weight, shipboard landing. At approximately 48,500 lbs (not operationally unreasonable) an approach to spot 4 with winds 20 to port at 4 kts, and a Cobra parked on spot 5, placed the aircraft in a situation where we ran out of power. With the TCL at the hard stop, interim pwr on, descent rate could not be arrested, and evasive action had to be taken to prevent hitting the side of the ship. Consideration should be given to improving winds, or flying a straight-in approach to the stern of the ship with high gross weights.	2
The left window is to small to properly clear the aircraft over the ship with NVG's	2
FLIR image is very poor quality.	2
The sharp edges if the buckets that hold the trapeze arms are unacceptable. Get rid of them and use a soft starp to stow the arms. In the interim, pad and type the edges to prevent head lacerations. Move the battery box that hangs from the cabin ceiling. For now, pad and tape it to prevent head bashing. See other safety comments about the trapeze.	2
Crew door window is too small to effectively clear the aircraft on the right side.	2
ICS volume is too low.	2
Cannot clear the left side of the aircraft during NVG CAL landing's with a troop siting in the sit in front of the window. Also with just the back of the troop sit taking up half the window the observer has to turn his head on a forty five degree angle to attempted to clear the aircraft into the LZ.	2
No place to relieve bodily fluids.	2
Relief facilities needed	2

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Effects of downwash on personnel coming off of rope in the target area is and will continue to be the major planning consideration when using the V22 for this mission.	3
The CV-22 does not have jump lights, pre-op coordination for drop/no drop indications allow experienced jumpers to conduct ops. Safely. Conventional or less experienced personnel might be subject to confusion leading to jumpers exiting the acft during an unsafe situation. Ideal locations would be on both sides of the ramp at station 679 and a single set on the forward edge of the roof egress hatch. Availibility of a coayil cable port to the acft GPS system would enhance the usability of GPS repeater antenna. This would allow troops to have GPS reception in the cargo compartment during flt, enhancing operational capabilities during had ops. Also, acft noise is projected forward if the plane when in conversion mode (you can hear it coming)	3
Not enough personnel	3
1. No hand holds throughout the aircraft. 2. Slippery deck 3. Poor lookout doctrine for crewmembers 4. Excessive G's while maneuvering 5. Excessive rotorwash and debris 6. Poor ability to fight fires on ground in the engine compartment or apu	3
Fastropping out of the V22 will require a lot of pre-flight planning to optimize positioning relative to the target and the actions in the objective area in order to minimize downwash impact on friendlies on the ground.	3
the crew door is to small and very hard to open, this could make an emergency egress very difficult, there are not enough windows and the windows are to small to be able to have a good aggressive scan.	3
Issues: continued presence of false alarms desensitizing aircrew to cautions/advisories; high number of "A799" unreproducible discrepancies in the Aircraft Discrepancy Books due to failures that seem to be situational or transient in nature; far too many failures in systems that have nothing to do with tiltrotor technology (I.e. fuel system, MFD failures, Environmental Control System).	3
THE SAND SPRAY IN THE EYES AND THE ROCKS FLYING INTO THE CABIN CAN DANGER A CREW MEMBER, OR THE A/C	3
Clearing the aircraft during airplane mode is extremely difficult on the starboard side of the aircraft due to the small window in the crew door.	3
We cannot use the seats and seat belts with jump ops.	3
The ramp needs more non-skid.	3
We could use a better non-skid just for the aircraft wash or in the rain, it's still very , very slippery on top.	3
ECS= Totally unacceptable.	3
Cabin Door= Tasking, unfriendly, not practical.	
ICS= Volume level is poor with wind noise in cabin from open exits/doors.	
Needs non-skid.	3
The seats half covering up the small windows does not seem too smart. It was difficult for the JM at the door trying to spot and getting blown around.	3
Stands on the boat	3
Interim power activation above 80 kts only creates to long a period in the height velocity avoid area. Int power should be set to deactivate at a lower nacelle angle to allow translational lift and wing lift earlier on departure. The falling off of MFD filters can pose significant wash out in the cockpit.	3
WIA 56 should be worked on in the helo maintenance mode. Any rotor head maintneance is unsafe and hazardous in helo mode. Since this A/C covers a large are everyone should have ICS for safety purposes at all times when power or hydraulic is applied.	3
FIELD OF VIEW: Positioned in the left window in the Charlie pattern the ship cannot be seen. If there was a troop in the troop seat in front of the window the AO could not clear the left side of the aircraft safely to the deck of the ship. Cannot clear the aircraft in airplane mode with the right upper hatch closed (window to small)	3
Some tasks require breaking safety rules such as R&R swashplate actuator. The maintainer must use the rails to support the top of the actuator during maintenance tasks.	3
need a red and green light for the release in the cabin.	3
Almost all tasks performed on aircraft are in a very limited spaced area. This accounts to injuries and many dropped and lost fasteners and hardware.	3

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a IMC recovery on the standby instruments will be difficult at best	3
Clearing the V-22 into a small landing zone from the left window is difficult with the combination size of the window and Troop seat in front of window. Your scan is only from the 930 to 10. The Aerial Observer cannot see the left rotor tip. Clearing the aircraft from the right side is impossible with the upper crew door closed. (Window too small)	3
With the cockpit door, upper cabin door and the small window size on the left side the crew chief has no situational awareness.	
Lack of communications clarity on Oxygen at high altitudes caused concern with ATC under IFR flight. Lack of anti ice and de ice equipment posed significant risk even though flight planning was prepared to avoid icing. Weather is too unpredictable in the winter months to not be equipped with this capability.	3
The fluids that leak from the engines and nacelle area is completely unbelievable. The engine smoke at lightoff can be so thick at times the cabin visibility is down 3-5 feet momentarily. Most any panel on the nacelle can be opened with a chaffing wire bundle visible at a minimal look inspection. Also FADEC cooling fins designed to keep the component or box from overheating are continually being covered with grease slung from the swashplates on all aircraft. In the slipping removal/installation task, the connector plugs in lower nacelle are unaccessible and while trying hand/limb amputation could occur.	3
again. We need more and bigger windows to in back.	3
Executing fastroping operations to a GOPLAT is a high risk operation for the ropers. Executing with the V-22 increases this risk, should not be considered a primary option for insertion of troops until we develop a better technique or can control the downwash.	4
Crew comfort due to inadequate ECS operations, Crewchief has no hand holds and crew door is too short.	4
The windows are small w/ out shooters gear and an explosive to open worries me. Is there other means of opening before deck cord is blown? Seatbelts are not big enough and snap is down too far on the seat. When sitting next to someone with gear I can't buckle or unbuckle.	4
Need more visibility for aircrew to clear aircraft in zone. ICS needs something to block wind so it doesn't break up while trying to call in aircraft.	4
Crew Door window is too small to effectively clear the aircraft on the right side.	4
Need more visibility for crewmembers in back. Long cords need to be improved.	4
HST lost gear, reflective vests, multiple times. Need to reconsider position of HST members for both safety and mission effectiveness. One HST member was blown off his feet, perceived that engine exhaust was burning him, attempted to move but was continually blown to the ground.	4
During overwater flight with a full combat load of Marines, there is concern regarding egressing pax if a ditch is required. Cluttered aisle way and bulky gear on pax would greatly effect ability to egress aircraft. Additional concern exists regarding blowing rescue hatches/doors if aircraft is submerged in water.	4
Need a stick position indicator.	4
Not enough personnel to do day and night missions. Need min. of 5 personnel to do day and night mission.	4
Field of view is bad on both sides of the A/C and comm with the pilots when calling approaches is very difficult.	4
V-22 fuel tanks not certified, rather waived. Cabin seatbelts are not suitable for Marines with any type of gear. Packs are placed on the cabin floorboard at the Marines feet, blocking the walkway for the aircrewman and potentially making emergency egress difficult if not impossible (especially for a water landing). Lack of reserve or contingency power is of major concern.	4
Field of view, the windows need to be enlarged or bubbled so the crew in the back can more effectively operate	4
Fast roping went well, but the ground crew has to be very wary of FOD flying around and rotor wash blowing them away.	4
Quality of work conducted on this aircraft is an issue. We seem to continue to find items from the factory that are suspect when it comes to quality assurance.	4
See previous questions.	4
Field of view stinks for the aircrew in the back.	4
As we transition into translational lift and lift is lost from the wings it requires an enormous amount of power to reduce the rate of descent, in a heavy state aircraft will have a challenging time with landing.	4
The seat adjustment handle does not spring back after pulling for adjustment. The handle was not recognized as not being full forward therefor seat dropped during first landing.	4

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Need to do some thorough training, plus compensate with good pre- and during-mission planning to compensate for the aircraft's tendency to suddenly settle close to the deck. This tendency is aggravated by weight, crosswind, loss of wind effect, wingman's downwash. Lot's of ways to get into a jam.	4
Additional considerations should be given when taxiing the aircraft in close proximity to people, equipment, aircraft etc. when ice and snow are present. It is almost unbearable to stand in the cabin door and clear the aircraft due to flying ice.	4
Did egress training for GCE. The seat belts are dangerous. When unlatched, they create 25 "nooses" to snap people trying to get out in hurry.	4
The non-skid on the ramp needs improvement. If the deck gets slightly wet, it would be very dangerous. The ability of the V-22 to climb and descend at a rapid rate may cause problems with sinuses and automatic opening devices.	4
Lottle giant ladder and stand usage on the boat as well as no crane and adapter sling for generator removal on the boat.	4
Just the change of placement of the emergency blowout handles, they will be pulled accidentally.	4
Not really a handling quality issue but today we attempted a rapid/emergency descent from 10k, as we turned into the 75 degree angle of bank, and began the rapid descent the gearbox indicators all went into the yellow or red, which wasn't very comfortable, all recovered relatively quickly (5 seconds) but one took a little longer (10 seconds), this was uncomfortable waiting to see if the guage/system would recover or not.	4
Rear crew require face and eye protection for desert operations.	4
PORTHOLES TOO SMALL. CREWMEMBER SECURITY DURING MANUVERS. HEAT RELATED INJURIES DUE TO ECU SHORTCOMING.	4
Since the stands needed to reach the nacelle are so big and bulky, so maintainers tend to stand up on the rails or straddle the nacelle to get the extra clearance they need to reach certain parts of the hub.	4
Windows in cabin are too small to provide proper lookout.	4
The maintenance stands that we use are either too big or too small to reach the areas we need to work on. You often find yourself standing on rails to reach the maintenance area because the stand is not tall enough. There are a lot of tight places to work on the aircraft and you often hit you hands. The safety harness' are hard to work in.	4
Dusty LZ's will be problematic when loading troops. No hand holds. Shoulder seat belts have the potential to snag weapon and parachutes.	4
Lookout capabilities in cabin of aircraft.	4
ECS is unable to maintain proper cabin temperature. This helps to induce air sickness during defensive maneuvers	4
As long as the crew members are strapped into a seat there are no great issues. BUT as soon as they do there job the risk greatens. The aircrafts G loads toss the crewmember about the cabin as they desperately try to maintain a continual scan for bogies, SAMs, and AAA sites. The crew members should have "sizeable" portholes through which they can properly see from the security of crash worthy seat. Enough said.	4
As long as the crewmembers are strapped in to a seat, the issues are acute. When they are on a gunner belt acting as an observer , the flight has now become a "fight". Portholes should be visible from a seated position (PERIOD)	4
The crewchief field of view was unsat during airplane mode.	4
Having to stand on work stand railings to reach components. Working on top of the A/C while raining. Non-skid could be better. The fluid transfer problem is putting us into contact with hyd-fluid more than is normal which raises health concerns. It also costs a lot of money to keep servicing and deservicing the aircraft.	4
1. More emphasis should be placed on properly ensuring that crewmembers flying on the aircraft are properly instructed and attend all briefs. The potential for injury does exist if proper procedures are not adhered to.	4
After deploying the bundle, you must be aware of tiedown straps, cutaway material, etc.	4
Having only one static line prevents both crewmembers from being able to push the load all the way out. Only the crewman on the static line hookup can push the load all the way out. Two static lines would assist in many ways.	4
Safety is taken fairly serious	4
cabin deck should have non-skid on the floor to prevent slipping . Seat belts issue needs to be repaired	4
I feel that the air craft should have a lower crew door that is taller in the closed position.	5
Confidence in automatic refuel cutoff systems remains less than desired.	5

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It is difficult to get in and out of the pilot's seat when hot-seating. Armrest are difficult to adjust.	5
The stands should be looked at when gaining access to the swashplate actuator area in the helo mode. Non-skid areas wear out fast. The crew door latch should have a recess lock and click section when opened.	5
The only unsafe conditions I have encountered has been on the USS Essex, with the rocking of the ship the B-7 stand wasa hard to control as well as the B-2 stand.	5
It will take deliberate effort to train to effectively weed out what is important to look at when flying instruments in this aircraft. There is a lot of redundancy that tends to clutter the view.	5
pilots need to rely more on the aircrewman to make clearance calls rather them clearing themselves. I feel that there field of veiw is limited.	5
This aircraft is good to the pilots, but it NEEDS and AOA gauge, and a HUD/HOD would make it better.	5
maintenance control needs to be a little less pushy when it comes to signing off the a/c. If more time is needed to look at the a/c then that time should be allotted in a relaxed setting attitude	5
Work with the A/C more to familiarize crews with deck space limitations etc.	5
The temperature in the back of the aircraft is unacceptable. On a long flight the extreme coldand the extreme heat could be a health factor. Extreme caution should be taken for hydration, and keeping your body warm.	5
Safety in the MOTT has not been a real problem from what I've seen.	5
With this task (PRGB CHANGE) there is a lot of oils and hyd-fluid and fuel that drips and creates a hazard. A good job was done on containing this hazard though.	5
Some of the maintenance stands need to be repainted to show when the safe operating limit is reached when raising the stand.	5
Field of view from the left side of the A/C could and should be improved from the cabin	5
Downwash that affects communications between crewchief and pilots will have to be looked at and methods developed to improve the quality of comm while calling approaches.	
Cargo hook design would be better if it incorporated a mechanism that would allow the user to select lateral movement of the hook for pick-up and then switch to full articulation for fast flights. A change in design similar to this would prevent excessive swinging of pendant and possibly prevent injuring HST personnel.	5
Safety strap is too short, serious problem - broke off in flight.	
Pendant cover came off in flight.	
No VOX capabilities on cabin stations.	
When the aircraft is on the deck and the hell holes are open, a lot of high temperature exhaust comes up through the hole. If you are not careful you can burn your face eyes and hand hands. Maybe some type of face and neck coverings could be used? Like what a firefight would wear.	5
The aircraft attached regulator for the left seat can sometimes impinge on the left armrest which restricts pilot ability to operate left TCL smoothly in flight critical phases such as landing. Also, Pilot attached regulator on the standard SV-2 came off in flight, rotated 90 degrees forward and restricted aft application of cyclic for the co-pilot. This problem could be easily repaired by flight equipment alterations. In all other respects, flight controls were deemed to be extremely effective.	5
Field of view is and will continue to be a problem in the back of the aircraft and will continue to somewhat affect the safety and crew comfort level.	5
Field of view on l/h side of cabin poor.	5
Flying around CamLej area, transitted at 45 In to expedite. At that nacelle angle, it is easy to get close to overspeeding the gear if you aren't careful.	5
INS-derived wind velocity is a nice function, but seems unreliable unless straight and level.	5
seatbelts once againg, may need to be lengtened for personel wearing gear	5
Initial testing of jettisoning the pilots doors revealed extensive damage to the aircraft and potential injury to the pilots. The effects of jettisoning the doors after submersion in water has yet to be discussed.	5

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Once you have busted the RAWs tone once, and the aircraft remains below the set RADALT low altitude, there is no beep tone to inform the pilot that he is still below the set altitude. Admittedly not a normal set up, it may be a desirable feature for VLATT < 300' AGL and could be activated once the wheels were up and locked. With one pilot heads in and one heads out on a typical Mission, it might just save the crew from CDIG.	5
Field of view directly affects the overall safety of operating the A/C!!!!	5
Clearing the aircraft, in aircraft mode, can be extremely difficult because of the small window in the crew door.	5
Had a left Nacelle blower fail that did not remain latched, but returned for maintenance actions. Jettisoned all remaining flares after two runs, jettison worked fine.	5
NFE	5
Aircraft needs an AOA gauge. Its helps with instruments, on the tanker, during TERF, heavy GW approaches, etc. An AOA gauge would greatly improve safety and pilot SA.	5
The fuel venting was a very cautious situation. You have to come to a strait and level attitude for a few minutes in order to give the fuel a chance to settle and quit venting.	5
Field of view from cabin towards rear of aircraft does not allow for good lookout doctrine for wingman or threat ingress toward flight.	5
Cockpit definition of duties has to be clearly delineated for success.	5
PF has to be extremely suspicious of needles and FDP guidance and constantly cross-check/verify what has been input into the system for him to follow. As an example, we flew a Tacan approach immediately after flying an ILS and forgot to reconfigure the CDI as a TACAN CDI (vice an ILS). Thus we had what looked like a perfectly good CDI that was keyed to the wrong Navaid, and unfortunately because the needle configuration is not on the top-level NAV layer, it requires deliberate action (more than just a scan cross-check) to go into the system and verify how it's configured.	5
Increase the field of view on both sides of A/C (possible bubble windows)	5
Need to work out landing spots compatibility - I.e 1/3/9. Doesn't seem to be enough room to operate spot 2 and 1 or 3 for skids on 1 and 3, V-22 on 2.	5
W/ exception of seat/seatbelt issue, no problems.	5
Seatbelts are extremely unacceptable. If jumpers are wearing O2 masks, they must cover the mask when approaching the acft. A mask full of dirt and sand is a safety hazard w/ O2. The O2 tech must also protect the consoles and hoses from the dust that gets sucked into the cabin.	5
The seatbelts and seat need to be replaced. Their design is ineffective for what we do and should be replaced w/ a more standard seat and seatbelt. (specifics are below).	5
Modification of bolts located in GLE magazines to avoid any explosive mishaps during loading, downloading and in flt Ops.	5
Would not recommend left seat landings on spot 2.	5
as discussed	5
Wind envelopes need more work, but currently acceptable.	5
Transition pilots need plenty of sim time prior to hitting the fam pattern, to start burning in new habit patterns and working through high workload periods (takeoff, landing, transition/conversion).	5
Field of view stinks and there are no warning tone for the crew in the back.	5
desert environment operations may prove to be operationally difficult with extreme brownout. Externals, FARP, etc. will be very difficult, and anything at night will be worse	5
What would the effect be on an individual utilizing the emergency hatch blow-out while he is underwater?	5
Inflatable support around the acft in case of water landings. Looking at helocasting and launching boats out of the back, will the prop wash be a factor for Marines in the water?	5
None noted	5
While doing certain tasks, going up and down the stands to raise and lower to do the job is time consuming.	5
The upper crew door should be easier to work up and down. Comes off the tracks to easy. This could become a issue. Long cords could be better designed. They are to hard to control and could become an issue as well.	5

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When the cockpit door and the cabin crew door are both closed it greatly increases the chances for the aircrew in the cabin to experience air sickness (vertigo). Obviously this negatively affects a good lookout doctrine and safe clearance calls to the ground.	5
Windows are too small for proper lookout.	5
Need to ensure that good ICS calls continue to be made to allow the crew and flying pilot to be aware of when the co-pilot has his head down in the cockpit	5
IETMS is going to cause inexperienced mechanics to hurt personnel or damage property if not closely monitored.	5
Need some kind of face shield or contraption so the crewchief has an extra hand to hold on coming into the zone.	5
Rear crew visibility is becoming more of an issue - this will have to be corrected by technique rather than design change as the fuselage structure is unlikely to be altered at this stage. During landings, the visibility in snow for the crewchief is significantly reduced by recirculation - nacelle clearance is achievable but propotor clearance from an obstacle might well be impaired.	5
Windows in cabin are too small for effective lookout.	5
The grunts could not figure out how to correctly wear the seatbelt. There was hardly any room for the packs in the isle, making an egress virtually impossible. With 24 troops on board, access to the left window to clear the aircraft was not possible. The ramp was not visable once the grunts were onboard with their gear, so the crewchief had to exit the crewdoor to walk around the aircraft to see the ramp from outside. The ECS would not be able to cool the cabin when warm and temperatures would become unbearable when in airplane mode, thus making pax ill without proper cool and fresh airflow. There are not enough oxygen points for all grunts and crewmembers.	5
Aircraft needs an AOA gauge and a day/night HUD or Heads Out Display.	5
Field of view and lack of hearing warning tone from the A/C systems, crewchiefs need to have the ability to hear the warning tones.	5
The icy conditions are a concern on all V-22 missions.	5
Need to have awareness of stall speeds, particularly in a turn, when down low due to limited altitude to recover.	5
Its hard to do NVG ops with the V-22 because all the downwash from the bird knock your goggles around your face.	5
V-22 knocked goggles around.	5
crew door very hard to work. Very hot in back. Limited visibilty. Gunners belt does not clip into big tie down rings. Ics gets broken up too easily by wind, need face mask to block wind	5
Need to address the on going problem (identified by DT) of communications with the O2 mask	5
AOA gauge needs to be added to MFD, HUD, and SFD.	5
Windows in cabin are too small for proper lookout.	5
The ground handling team kept losing tools.	5
without form and position lights, the V-22 disappears on a LLL overcast night.	6
The exhaust of the engines may at some point flow directly over the fueling stations in the catwalks which may ignite the station.	6
Integration with other aircraft in the pattern is extremely easy	6
No form questions....form discussion and positions discussed in OPEVAL flight summary.	6
none noted.	6
aircrewmn need to breif with pilots to ensure that every crewmember is on the same sheet of music.	6
Great system for emergency escape..blow out windows and lighted escape exits. Perhaps you should put one in a controlled water environment to find out the acft position should it start to sink I.e. all CH-46's are designed and will tip upside down once in the water, what will the osprey do?	6
Initial look shows power charts predicting high power required number below 5K feet and low power required number above 5K feet	6
none noted	6
WE WERE ONLY UP FOR ABOUT 5 MINUTES WHEN WE GOT A PRGB HOT WARNING. WE DID WHAT NEEDED TO BE DONE, FOLLOWED THE EP'S AND RTB. EVERYTHING WENT SMOOTHLY WITH GOOD CREW COORDINATION AND NO PANIC.	6
The downwash is my only concern, when fastroping onto a small space, but as I mentioned before this can be overcome with additional training.	6

S-9 Results

None	6
overall I think safety was a big concern when making items. That is why everything has many warning, cautions and advisories	6

S-9-1

COMC05: Rate the suitability of the intercom system.

Comment Total Responses 116 (Avg.) 4.2

YOU SHOULD BE ABLE TO HEAR C/A TONES FROM EVERY ICS STATION AND THERE SHOULD BE MORE THAN ON HOOK UP ON EACH ICS STATION. 2

You should be able to hear wca tones from all ICS stations in the aircraft for situational awareness. There should also be more places on each station to hook up long cords. The aircrew members in the back should also get more into learning how to make radio calls to eliminate some of the work load off of the pilots. 2

Need to be able to hear wca tones from all ICS stations. 2

See previous comment. 2

YOU SHOULD BE ABLE TO HEAR C/A TONES FROM ALL STATIONS IN THE BACK OF THE AIRCRAFT. THERE SHOULD BE MORE THAN ONE COMM HOOK UP ON EACH ICS STATION 2

SHOULD BE ABLE TO HEAR THE C/A TONES FROM EVERY ICS STATION IN THE CABIN OF THE A/C. THERE SHOULD BE MORE THAN ONE HOOK UP FOR ICS ON EACH ICS STATION 2

My microphone went dead slowly throughout the flight. I find it difficult to get enough ICS volume to hear adequately in the aircraft when receiving radio transmissions. ICS needs more volume. It will be very difficult with more radios. The comm system is not compatible with other SOCCOM aircraft, so our teams must have another piece of gear to transload from one aircraft to ours. The plug is too large and gets caught on the seat or airsave vest. The cord is too large and stiff. 2

Not clear on Oxygen on extended flights over two hours at altitudes above 19000 feet MSL. 2

Volume too low. Plug too big, cord too stiff. 2

THE C/A TONES SHOULD BE ABLE TO BE HEARD FROM ALL ICS STATIONS IN THE BACK OF THE A/C FOR SITUATIONAL AWARENESS. THERE SHOULD ALSO BE MORE ICS CANNON PLUG ATTACHMENTS ON EACH ICS STATION. 2

NEED TO HEAR C/A TONES FROM ALL ICS STATIONS IN THE CABIN. There needs to be more than one ics hook up on each ics station. 2

NEED TO BE ABLE TO HEAR C/A TONES FROM ALL ICS STATIONS IN THE PLANE, THERE SHOULD ALSO BE MORE THAN ON ICS HOOK UP ON EACH ICS STATION 2

ICS long cords are difficult to use, the key-ing switch on the aircrewmans cord is difficult to operate while busy with both hands. It would be great if we could evaluate several different types of aircrewman keying handsets . 2

Comm between pilots and aircrew was fine, BUT only the ICS station at the jumpseat receives APR interrogation audios. Unfortunately this leaves the observer totally unaware of incoming SAM's and possible AAA sites, UNLESS his eyes are in the cockpit. With this he is definitely not performing his duties as observer. ALSO, at these other stations in the back the crewmembers can not hear audio CMS warnings, which are very important to crew coordination. 2

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to much wind in cabin w/door open to talk to pilots 2

ICS volume is too low when using earplugs. 2

YOU SHOULD BE ABLE TO HEAR C/A TONES FROM EVERY ICS STATION IN THE BACK OF THE A/C. THERE SHOULD ALSO BE MORE THAN ON HOOK UP ON EACH ICS STATION 2

The caution/advisory tones should be heard from every ICS station on the aircraft for situational awareness purposes. There should also be more than one comm connection also so more people can be hooked up in back. 2

A cable will need to be fabricated for a "J" connection to a "BNC" connection. We use 119s that have J connections for the antenna. 2

S-9 Results

Cabin ICS should mirror the cockpit.	2
Each cabin ICS station should have two cord connections. When the airplane is loaded front to back and the right ICS station cord fails it's impossible to get another ICS cord	
When the pilots are in private mode, you can not here the cabin aircrewmembers transmit. From a safety prospective, it would be nice to be able to hear them transmit.	3
The caution and advisory tones and warnings should be able to be heard from all ICS stations. There should also be dual comm cord hookups on all ICS stations.	3
cabin ICS should mirror the cockpit ICS	3
Volume levels with the cabin doors open are barely readable. The only time that the ICS seems completely usable is in airplane mode with all doors secure.	3
Poor in back of cabin - rear crew nable to hear what the pilots are saying, particularly when the door is open	3
Volume levels for the ICS is not acceptable. With your helmet on and hearing protection in place the only time you can hear adequately is when your inside the aircraft with all doors closed.	3
While refueling the aircraft the weather conditions were windy with heavy rain. The ICS for the crewmembers outside became unusable after 3-5 minutes due to water in the ICS cord connectors. I took over for the first crewman and within a few minutes my ICS started to deteriorate in both transmitting and hearing. After the refueling evolution I was able to dry my connectors and restore some of the ICS, only after 15-20 minutes of being inside the aircraft was it completely usable again.	3
Need Vox, EW, and WCA on comm stations	3
The wca tones should be able to be heard from all ICS stations in the back of the aircraft for SA. There should also be more than one comm cord hook up on each station.	3
- Need VOX on all crew stations in the cabin.	4
- Need 10 - 25 Watt AMP on FWD RT Comm box...hard to hear crew with upper cabin door open..	
The ICS volume is too low when using earplugs. I feel earplugs are still required under the helmet. Microphone quality in the oxygen mask is unacceptable, becoming garbled and unreadable. The connections are non-standard to other ground and supported units that may come off another type of aircraft. The helmet connector is too large and the cord too long on my helmet, the connector also gets caught on other flight gear and/or the seat.	4
Need PRIVATE ICS mode.	4
crewmembers does not get crew alert tones at cabin ICS stations.	4
The private selection does not work in an acceptable manner. When two crewmembers select private they can not be heard by pilots and they can not hear the pilots. They should only not be able to hear pilot if the pilots select private as well.	
Same comments as always. I have a difficult time hearing the ICS with any chatter on the radios. The cord is too stiff, the plug too large and it gets caught on items in the cockpit and on the pilots body. Non-standard plug means that special equipment will need to be provided by the squadron for the ground component,	4
Our hookups aren't like the rest of the fleet. We can swap cranials with other fleet Marine/Navy aircraft	4
Today we rehearsed GOPLAT missions, the crewman were moving intensely about the cabin, it would have been nice if they had had a wireless comm unit.	4
Aft Cabin crew should be able to hear WCAs.	4
With 23 kts down the deck and the crewman sticking his head out of the door to give a verbal con, the resultant wind noise made the instructions over the intercomm difficult to hear.	4
All aircrew should be able to hear all WCAs to include ASE information.	4
ALL ICS STATIONS SHOULD HAVE DUAL LONG CORD HOOKUPS AND SHOULD ALL HEAR THE TONES FOR CAUTIONS AND ADVISORIES ON EVERY ICS STATION. THAT IS A SITUATIONAL AWARENESS PROBLEM. THE PILOT CAN HEAR AND ACKNOWLEDGE THE ADVISORY WITHOUT THE CREW IN THE BACK OF THE AIRCRAFT EVER KNOWING.	4
Flight was conducted at 25,000 feet, at which the ICS/radios were extremely difficult to hear and understand for all crewmembers. As the aircraft decreased in altitude the ICS/radios slowly cleared up. The problem was not an inner ear pressure issue, but a static/garbled aircraft ICS issue. The private selection on the cabin ICS stations does not work, which is beneficial during crewmember training and communication between gunner/observer/crewchief with out interrupting the pilots.	4

S-9 Results

On the ground at at low altitudes, COMM and ICS was not a problem both with and without the mask. At altitude...above 15000', very difficult to understand aircrew in the back. VERY garbled!	4
Volume level in the cabin with cabin doors open is poor. The only time ICS is really acceptable is when the aircraft is completely closed up.	4
Having problems keeping the pigtail of the helmet firmly in place in the aircraft receptacle. This has caused me to miss radio calls and has degraded crew coordination.	4
-The entire ICS could use some additional volume. With hearing protection in and a flight helmet the ICS Master volume has to be turned all the way up. With the upper crew door open it is EXTREMELY HARD to hear the ICS. -Note: the mask problem from question 6 applies here to.	4
see comments from question 2.	4
ICS at 12,000 feet with the oxygen mask is barely usable, even equipped with the new microphone.	4
Need VOX on all ICS stations in the cabin. Right FWD box, need a 10 - 25 AMP watt Booster. Hard to hear the crew with upper crew door open, NR @ 100 % with ICS cranked all the way up.	4
VOX is outstanding...it allows hands free communication and keeps myself from making an inadvertant transmission with the foot switch when I do not want to. ICS volume is too low, I use earplugs and the ICS volume gets masked by Radios when they are loud enough to hear, and by voice warnings/tones. The Oxygen Mask microphone does not work as well as the boom microphone.	4
Crew Chiefs should be able to hear all WCAs. They should be equipped with a microphone system that would allow them to use their hands foe something other than as a wind guard for the mic.	4
Lacks the ability to adequately adjust volume. ICS is too low in flight, I would like it louder to use earplugs under my helmet. The other option would be to utilize an active noise reduction type headset in the helmet. The ICS cord on the helmet is too long and the connector is too large, tending to get caught on the seat or items on the airsave vest.	4
With my ear plugs in and helmet on it is very difficult to hear the ICS at times. This is with my volume knobs turned all the way up.	4
Aft cabin crew should be able to hear all WCAs that are heard by the cockpit crew.	4
With our required double hearing protection in place (ear plugs & helmet) it is extremely hard to hear the ICS at times.	4
There is high rotor wash when making calls around the crew door. The high winds drown out the crew member that is making the calls therefor it is hard to understand what the crewmember is saying.	4
No acceptable window for stick leader.	5
Tried flying without earplugs and the voice warning blew me out. I have gone back to earplugs and ICS is not loud enough. The microphone in the mask is unacceptable becoming unreadable after a few minuts at altitude.	5
Works great except for calls to the deck. You have to put your hand over your mouth in order to be understood correctly. The wind and rotor wash make it impossible to be understood by the rest of the crew.	5
Pigtails are not common to all fleet aircraft. Need common pigtail or adapters to allow aircrew who are mission commanders compatibility with other aircraft. O2 Mask connections need to be longer to more effective.	5
The ICS cord used is not very pliable and this makes it difficult to roll up. This results in the long cord being in the way in the cabin.	5
Haven't experienced too many difficulties with ics.	5
Only difficulty encountered was in understanding ICS coming from aircrewman standing under turning rotor. High wind noise made him very tough to understand.	5
Private mode, in the cabin, is not functional.	5
CABIN ICS STATIONS DO NOT RECEIVE AUDIBLE WARNINGS.	5
Crewchiefs should have wireless cords. Vox function works well.	5
No problems noted, vox works great especially under high work load.	5
ICS faults on Jump Seat and crew chief ICS stations on startup.	5
The ics system is a working system that could be bettered by adding the ability to hear the wca's in the back at all ics stations. Also if the pvt feature worked as advertised it would be a good tool to conduct student evaluations in flight.	5

S-9 Results

When crewchief is in the door calling the approach he is in the door, the wind and downwash is so bad that it is very difficult to clearly speak into the mike. Covering the mike with one hand helps but does not fully fix the problem.	5
The clarity of the voice comes w/ the pilot the ICS was excellent. I don't if there was a 2nd 'jacks' in the back. With in-cabin mobility so limited, it may be useful to have a in jack for troops near the back ramp so the troop commander could pass word to the troops at the far end of the A/C.	5
Should be to hook ups at each ICS station and we should be able to hear all warnings, cautions and advisories.	5
Very good & clear ICS, but cabin crew must stay out of wind or they become very difficult to understand (I.e. when they lean into the breeze to clear the aircraft during a CAL.	5
Difficult in cabin with the high winds, must always have hand over mic in back, witch can be a safety issue.	5
The crewchief does not hear audible warnings, which could greatly assist aircrew coordination if heard. Aft ICS stations can not be isolated from pilots on all aircraft, this needs to be repaired so aft crewmembers can speak without bothering the pilots during instructional flights.	5
ICS chords still don't match other fleet assets.	5
The ICS system is a good design however the aircrew in the back would be benefited by the ability to hear cautions and advisories as they occur as it would aid in troubleshooting.	5
The private feature of the ICS does not work as advertised and would be a good tool for aircrew instruction if the feature could be used efficiently.	5
Could hear the anti-collision lights strobing in the ICS. Kinda irritating.	5
ICS works fine, good VOX. Pigtail is non-standard and will be a compatibility issue with other aircraft in the MAGTF.	5
The suitability of the ics could be greatly increased by the ability to hear the wca's in the back and the private function working correctly	5
The clarity of the crewchiefs isn't as good as that experienced between the pilots. This would appear to be normal	5
The ics cord should be made out of a more pliable material so the cord can be rolled easier.	5
With O2 mask donned, as we preceeded to altitudes above 15K understanding the crew in the back become increasingly difficult. The problem seems to be a combination of the mask and specific crew stations.	5
Right jand seat pilot appeared weak to crew over intercom - helmet had checked out fine the previous day and so the situation appeared to be unresolved.	5
Calls from rear were easy to understand and had suitable clarity.	5
usmc	5
shorts out sometimes, and there is communication problems when the wind hits your mic and you are trying to make calls at the same time	5
The ICS works great except for when calling the aircraft to the deck. The rotor wash makes it hard to speak clearly. You have to hold your hand over your face and mouth to keep from being distorted.	5
ics could be utilized for training purposes in the back if private feature was working	5
the ics system could be greatly enhanced if the private feature worked properly and wcas could be heard from all ics stations	5
system design is workable but the pvt feature could be utilized to our advantage if it worked properly	5
Aft cabin crew needs to be able to hear all WCAs.	5
No large problems noted. It would be nice if there was some type of cover for the crewchiefs mike so that when he sticks his head out the window, there isn't wind noise.	5
The ICS stations in the back need to have two hook up points at each station. The aircrew in the back also need to beable to hear the warning, cations and advisory tones in the back for situational awareness.	5
The crew chief in the back should have the ability to hear the A/C warnings cautions and advisory. At this time he has no situational awareness of the A/C status unless told by the pilots or he is standing in the cockpit.	5
Good system although I think the crewchiefs should have a wireless intercom system, it would decrease their work load when confronted the heavy downwind of the aircraft.	5

S-9 Results

A wireless ICS capability would seriously improve the crewchiefs ability to function in the aircraft. Especially when attempting to manage a cabin while doing a GOPLAT mission.	5
the effectiveness of the ics could be improved by making the pvt feature of the ics work and the ability to hear wcas in the aft ics stations	5
The ICS situation in the V-22 is compromised when the stations are split, and they have to be split in order to have comm for all the crewmembers and the docs. Shortcords should be utilized due to the entanglement caused by all the long cords.	5
ICS comm appeared to degrade with all of the ICS stations being utilized. A wireless ICS system would be easier to manage in view of the many people moving through the cargo compartment.	5
No problem encountered.	5
Acceptable from an enlisted aircrew perspective.	5
Intercom system works as desired in respect to functions in the Aft Cabin.	5
Long cords are too thick.	
Helmet to Longcord connectors are not compatible with current fleet rotary wing aircraft.	
Helmet to Longcorc connector is a factor in safely egressing the aircraft in Emergencies.	
The ICS works fine the crewchiefs have good S/A with all the comm channels that are available.	6
Very clear!	6
no problems	6
no issues	6
VOX is outstanding....no reason to key the mic now.	6
Because of the lack of noise, it was very easy to communicate.	6
I had the ICS on throughout the flight. Very clear and comfortable.	6
No new comments from previous flights.	6
Good and clear	6
Good between pilots and aircrew	6
Excellent communication system.	6
First time troop lift. ICS awsome.	6
Ground commander was always informed of what was going on with the aircraft.	6
Clear	6

S-9-1-2

INS06: Rate the effectiveness of the V-22 during instrument take-off.

Comment	Total Responses	(Avg.)
Instrument go around with 61 Inac presented no problems	6	6.0
STO's are well suited for entry into IMC	6	
Requires a little more hand/eye cordination than conventional helicopters in that your adjusting pwr & nac to maitain 500fpm climbout.	6	
Stable platform with good SA through CMS	6	
60 degree STO is the smoothest transition to instrument flight	6	
Performed 'go-around' in conversion mode to 500' AGL - aircraft handled smoothly with no irregularities noted.	6	

P-FS01: Rate the overall safety during aircraft takeoff.

Comment	Total Responses	(Avg.)
Poor field of view from cabin.	28	5.1
		2

S-9 Results

Acft has a tendency to pitch nose high then rose low during transition. Requires a diligent scan by pilots. It is due to this tendency that the MOTT has implemented a "sterile cockpit" 200 ft and below.	4
No field of view in the back of the aircraft!!!! And the crew door is so low (knee level) that the crewchief has to use caution when standing there to call an approach.	4
Very forward down wash.	5
Just like the CH-53, strong wind while taking off but safe.	5
During short take-off it creates to match down wash and it will probably creates problem when the V-22 is operating with full compliment of SQ personnel. While taking on their maint. And stuff that will be brown down.	5
Everyone must be belted the foul line when they sto for VTO.	5
During a sto there is a large amount of wind behind the aircraft. If there was a LSE or another aircraft there is a problem.	5
the crew door is to short, even with a gunners belt on it is still very easy to fall out.	5
Personel should be aware of down wash when A/C STO	5
Good	5
Down wash is very strong for smaller type ships. High potential for personnel to be blown down or over the side.	5
See LSE comments from tower crew not a problem. VTO or STO. STO concern was drifting right unless airborne (esp. If launch from spot 4) - and had A/C on 1/3 in forward slash.	5
High movers seem to cause the LSE problems	5
Calculation of a single engine safety speed is a little difficult at present owing to the only performance tool being a 60 degree Inac graph. SSE is still therefore predicted by pilot feeling as a combination of nacelle position, altitude and speed. For confined area operations, it would be useful to have a graph that depicted flyaway speeds with a nacelle position of 80 to 85 degrees Inac, This would co-incide with the Interim Power cut out. The time spent in the avoid curve is difficult to determine and an attempt should be made to brief this figure during general performance calculations	5
Takeoffs are generally a non-event. I currently do not have sufficient experience to evaluate the aircraft at high gross weights and, based on the amount of torque required just to takeoff empty, I believe this will be an issue. One thing that is well-recognized is the aircraft's susceptibility to crosswinds.	5
High workload when descending the last five ft. of the deck.	5
Like any aircraft, TO and Lndg are the critical phases of flight. Needing only 30 kts for wing born flight, the AC has good bly away in case of engine failure.	5
On two occasions the seat has dropped from my setting on takeoff. Inertial reel is locked by the flight clearance so its an uncomfortable moment on takeoff. You have to stretch to reach the controls.	5
Know and warn about the charatcteristics of the A/C such as downwash, this did not prove to be a problem.	5
You have to pay a lot of attention to the Nacelles. W/ 4 ft. 4 in. of travel, you must be atune to lateral control inputs and at the same time be aware of high focus rollmode.	5
Minor issues with downdraft to personnel. No downdraft issues noted with acft on adjacent spots. Most STO take offs had tendancy to drift right - will be dangerous with acft parked in forward slash.	6
Only thing is that all personel should stand at a 45 degree angle when taking off especially when they do a STO takeoff.	6
A lot safer than a harrier take off.	6
Vertical is similar to the CH-53 stow take off , almost the same amount of wind preassure as the Harrier.	6
No issues	6
no issues	6
A little caution on the thrust while taking off, it caught some people by surprise throwing them off the deck.	6

S-9-1-3

S-9 Results

P-FS02: Rate the overall safety during enroute operations.

Comment	Total Responses	(Avg.)
Inputting data into CMS is not friendly and tedious. FLT plan manipulation is difficult and time consuming. Espeiclly during a tactical environment.	4	
No field of view in the back of the aircraft and unless the crew chief is hooked up to the troop commander station he has no idea of the aircraft warnings that pop up.	4	
Need a crew chief seat in a location where he can assist in the mission and can perform his dutys as a crew member	4	
CMS requires a lot of heads down time in order to work through it. Not intuitive for many functions. Unforgiving when a mistake or format error occurs. Still experiencing warm starts when a button push results in a software glitch. At night on NVAS it become even more challenging.	5	
The self diagnostics are awesome.	5	
Flying with inertial reel locked is tedious if you have to reach for cockpit items.	5	
Upper crew door window is too small to effectively clear the aircraft on the right side.	5	
Cockpit visibility is excellent and somewhat compensates for the terrible FOV from the cabin. Seeing/clearing either aft quarter is still a problem. CMS functionality is very keystroke-intensive and slow, requiring a lot of heads-down time. CMS memory buffer can't handle rapid, multiple keystrokes and additionally, the keys on the CDU pad take a very deliberate stab to actuate. Both characteristics further increase heads-down time. Exterior lighting used for formation (form & blade tip) are very inadequate. ON the plus side, DigMap is a great SA aid. Aircraft performance in APLN mode is excellent.	5	
I have strong feelings regarding the ability of the ECS/SDC to keep the cockpit/cabin comfortable and provide enough oxygen to four crew members.	5	
aircrew visibility is very limited in the back of the airplane.	5	
No icing clearane	5	
Too much heads down time, could be alleviated with the DIGIMAP on the center CDU with center seat aircrew member.	5	
I have noticed on both IFR straight and level ops and tactical scenarios that this aircraft brings a higher crew workload and demands an increased level of crew coordination over the aircraft it is replacing. This is directly attributable to the addition of sensors, navigation, and information processing/display features not found in helicopters. The multitude of systems unfortunately are, to some degree, heavily dependent on user inputs/updates to maintain current and accurate information. The best example of this requirement is the use of the FDP. The panel is a nice thing but only if it is vigilantly updated and maintained. If a flying pilot is using steering guidance based off the FDP, he nonetheless has to be highly suspicious of what he's following in case it is not updated in a timely manner. In some high-tempo cases, it is just safer and less-complicated to fly raw data than to try to keep up with all the input demands of the various systems. Thus you have a system that helps maintain situational awareness only if you had good enough situational awareness to program it correctly to begin with - there are few systems in the aircraft that can independently help unscrew a crew that is losing SA, with the notable exception being the raw DigMap (which is very nice to have).	5	
The issue of autorotation capability of the aircraft is questionable. Though engineers are still reviewing this issue, the inability to autorotate is a major safety issue if the aircraft is in conversion mode.	6	
No issues	6	
Very safe. Engine performance to date has been good with overall SA heightened by the Digmap.	6	

S-9-1-4

P-FS03: Rate the overall safety during terminal/objective area operations.

Comment	Total Responses	(Avg.)
Poor field of view from cabin windows. During conversion mode, poor field of view from L/H fwd cabin window decreasing situational awareness.	2	
Performance data needs to be accurate! Both in NATOPS and also mission computer. NATOPS was as much as 12% power than actual. OAT is suspect as being inaccurate! With suspect charts and power margins close, contingency power is mandatory.	3	
You must be way ahead fo this aircraft. It does decelerate as fast as you are made to believe.	4	

S-9 Results

The crewchief is in the dark no field of view his SA is down unless he is standing in the cockpit with the pilots.	4
need a new seat location	4
Aircraft is a pig for power on extreme short final (last 5-10 ft). The documented sudden ramp up in the power requirement to "keep the bottom from falling out" is predictable but so sudden, transient, and different from the power requirements further up the glideslope that a pilot is prevented from having an accurate assessment of the performance at the bottom based on how the aircraft is performing prior to that point. In other words, it is easy to envision a heavy aircraft coming all the way down a glideslope nicely and still having a hard landing.	4
again the crew door is too short and the crewmen have very limited visibility.	5
Limits for a precision approach on ILS need to be reviewed & then lowered.	5
Need to further explore multiship operations in the objective area and interoperability amongst ourselves.	5
Upper crew door window is too small to effectively clear the aircraft on the right side.	5
Field of view hinders the aircrew in the back we are unable to see what is going on.	5
Desert landings are a challenge, especially on NVG's due to airborne sand and dust.	5

S-9-1-5

P-FS04: Rate the overall safety during landing.

Comment **Total Responses** 34 **(Avg.)** 4.6

No seat available in a location to perform lookout duty	2
poor field of view. Inadequate hand holds and gunner belt attachment points in fwd cabin.	2
Looks a little shaky when the A/C gets about 4 feet from touchdown - understand this is a fly by wire A/C - Is there anything that can be added to improve seability?	4
Overall safety is good, however aircraft characteristics are unstable at low attitudes	4
In the desert environment, this aircraft in sandy conditions is very difficult. When brown out occurs in the majority of the landings, maybe this aircraft shouldn't operate in this environment.	4
Field of view is again a problem here we can clear the A/C on the right but not the left.	4
V- 22 performs very well during landings to hard surface areas. Has not proven itself effective in extremely dusty zones/desert environment. Crosswind landings can be challenging, as aircraft tends to weather vane toward wind line. Power available under hot high DA conditions is less than expected and routinely requires interim power.	4
The crewchief has one half decent point to clear the aircraft from and that is the crew door, but the debri blowing in the crew door makes it difficult to call and to see the zone. The rest of the A/C can't be cleared properly because the field of view is so bad from the cabin windows.	4
A/C moves too much over the deck, a couple close calls when A/C landed on cummings twice during underway.	4
When the aircraft hits ground effect the plane comes to unstable. One aircraft hit the knife edge and just about all of them flew over some part over the forward slash during landing. Could be a problem if Aircraft are parked in the slash.	4
Unstable when landing	5
A bit squirley at times, became more effective towards end of work up. Pilots need to pay more attention to LSE & Directors.	5
During night OAS positioning yourself for a left seat landing is a scary feeling especially when a A/C is on spot behind you.	5
A/C lands well, being top heavy A/C. Tilts greatly looks unstable	5
Seems like the pilots can barely control it after 10 ft or less.	5
Pilots should take a little more time hovering over the deck before landing.	5
Spots 5 and 6 should never be used. Navigational lights are really hard to see when conducting day light ops.	5
we need to have more and bigger windows in the back to safely clear a zone,	5
5 ft down the aircraft became squirly	5

S-9 Results

Need more experience at high gross weights, to include formation landings and shipboard landings. Nacelle manipulation gives a lot of controllability options for the final approach and landing. Sharp ramp-up of power required close to the deck as aircraft loses the remainder of wingborne flight can bite somebody hard and will be a huge training issue.	5
New extended probe design required pilots to modify no hover technique to prevent ground contact with probe tip.	5
left seat pilot has minor difficulty seeing lateral line up line on FCLP pad. Should not be as big an issue at the ship with the larger deck, better paint, and the superstructure for peripheral reference	5
Tendency to have a lateral darting motion 10ft and below.	5
High workload during the last five ft.	5
Same as question # 6	5
The lack of sufficient windows for the aircrew to provide an aggressive lookout and clearance calls is an issue. The field of view from the cockpit is outstanding and allows for visibility to the rear of the nacelles on both sides of the aircraft, but the inability to see aft of the nacelles by either pilots or crewman could result in not seeing an obstacle.	5
Downwash very high, unstable about 5 to 7 feet off the deck.	5
The modification to the AFCS to reduce lateral oscillations in low work has improved controllability substantially. Running landings are easy to control at nacelle angles of 85 degrees. Nacelle control offers the pilot a new dimension in controlling closing speeds during the final approach, a most welcome addition.	5
Deck landing work is safe but a lot of pilot control is required when operating to spot 7 of an LHA. Knowledge of the relative winds is critical to allow the pilot to anticipate the degree of control that will be required. I found that winds from starboard required a high degree of pilot workload that appeared to be irrespective of deck experience. Winds down the deck were most benign - winds from the port 90 required a high concentration on yaw control as the wind appeared to randomly knock the vertical stabilisers and impinge on the horizontal stabiliser.	
Areas of consideration would be landing with other aircraft at the same time.	5
Down draft significant to LSE directing acft to spot behind landing V-22. No downdraft issues noted with acft on adjacent spots. LSE unable to see position lights to determine landing seat during daylight. Acft seems to have difficulty landing with roll(ship).	5
Had mediocre weather, pitch/roll. Under these conditions landing worked out O.K. (See LSE comments.). Rough weather could be an issue.	5
Take to long for A/C computer to adjust land unstable at times.	5
To little room on port side to chalk and chain.+	5
Seems a lot steadier than an H-53 landing.	6

S-9-1-6

AD37: Rate the combat readiness of the PAXs upon arrival at the LZ.

Comment Total Responses 43 (Avg.) 4.8

The bird seems to take a while to come to a hover before being able to throw out rope.	2
No relief device	2
See #3.	2
Already discussed.	3
Room constraints and ineffective lighting aboard the aircraft.	3
It could take the pax a lot of time to get undone from the seatbelt while waiting in the LZ.	3
Areas considered: airsick	
Reaching the LZ after the fastrope because of prop wash it takes about 5 - 10 seconds to get their awareness and get into the fight.	3
only effective if you are carrying light land- no ruck, can't use seats w/full combat equipment. Not easy getting out of seatbelts on floor	4
Along with the areas to consider above, the seats and the fact that troops cannot put any gear under their seat impacts the troops ability to gear back up to egress the aircraft. The center isle is crammed with gear during flight.	4
If they can't relieve themselves (piss) or if temperature isn't reasonably they may not have their minds completely on the mission.	4

S-9 Results

we flew 8 sticks in about 4 hours total flight time. All the sticks were very short. For SOF operations the troops would have not been as effective because of a loss of SDC/ECS capability. The troops need a method of urinating for long range operations that is not currently available in the aircraft. The plan is to use piddle packs and put the filled bags in pockets in the back of the aircraft. The pockets cannot hold enough used piddle packs, and it is our opinion they will be replaced with gatorade bottles as an alternate method. No one experienced any episodes of airsickness.	4
The prop wash made extremely difficult to employ our weapons effectively.	5
Ability to fast rope onto a ship was good, rotor wash was extremely strong.	5
The rotor downwash was a lot most likely will move out once the MV-22 leaves the LZ	5
The only hinderance upon around would be the extream rotor wash.	5
small opening on the ramp slows off loading	5
The seat belts are very difficult to acquire an remove with load bearing equipment on.	5
Beware of white out and high rotor wash.	5
Needs urinal	5
Not effective until A/C moves off drop area.	5
Again, along with Q # 3 the downwash affects their combat readiness, because the Marines are trying to steady themselves, and would have difficulty aquiring a sight picture and taking a shot until the acft is gone thus affecting the dynamics of their assault.	5
Areas considered: day/night adaptation ear blocks	
w/o improved cooling, seating,seatbelts,urinal, they would be below peak performance levels.	5
As considered with the amount of prop wash. Shooters need to be in the fight as soon as they hit the deck.	5
A little cumbersome getting out of the seat belts	5
takes a little time for troops to get out of seatbelts	5
I don't feel there would be any problems..	5
Areas considered: airsick day/night adaptation ear blocks	
Need better seating - need urinal.	5
Transport and offload are increased by the higher rate of speed as compared to helos. The only problem experienced was w/ the white out landing.	5
Need a urinal system.	5
None of the above effected the Marines in training.	5
Areas considered: airsick day/night adaptation ear blocks	
Outside of comfort during transport the CV-22 present no unique limitations to employment of a free fall team.	6
for myself, I didn't have any problems. This aircraft is outstanding. Seats and restraints should be considered for reconstruction	6
Once situated in cabin, the ride was actually very comfortable w/ slight bumps due to turbulence.	6
No adverse effects. The only problems is it may be difficult to ready your weapon until you get out of the rotor wash. That would come from practice.	6
No problems.	6
Rotor wash.	6
As good as to be expected.	6
Major problems of AC is that on inbound the AC is extremely loud and can be heard on the ground 3-4 minutes out. Its much louder than other vertical lifting AC.	6
parachute operation. No problems	6

S-9 Results

No different from other acft. 6

Adaptation to all of the different sounds and change in speeds. From helicopter to plane - from plane to helo. 6

Areas considered: day/night adaptation

The rotors we are getting are not long enough for any serious discomfort, but the rotors that we are relieving are very good 6

I had no problems. 6

HF14: Rate the adequacy of the V-22 to provide aircrew and passenger comfort in operationally realistic environments.

Comment Total Responses 144 (Avg.) 4.0

No problems except no urinal! 2

Areas considered: Air sickness
Ear blocks

ECS is unable to maintain comfortable cabin temperature. 2

AS HOT AS IT GETS IN THE BACK OF THE AIRCRAFT AND WITH THE LIMITED VIEW, IT IS VERY EASY FOR PEOPLE TO GET SICK IN THE BACK OF THE AIRCRAFT, ESPECIALLY DURING HARD MANEUVERS 2

ECS is unable to maintain comfortable temperature in cabin. 2

No urinal seats too small, seat belts unsat, cooling system unsat, no hand holds. 2

ECS is unable to maintain comfortable cabin temperature. 2

No ability to urinate during flight for aircrew or passengers. 2

S-9 Results

The following information from previous questions applies to this question:

2

1. This mission was very ineffective against Fixed/Rotary Wing Threats or any threat that will involve lookout doctrine. The MV-22 doesn't provide more than 180 degrees of "Realistic FOV" and that is only from the cockpit. The term "Realistic FOV" is used because the only window provided for the crew in the cabin is approximately four inches in diameter, the crewdoor opening (Emergency pressure relieve window). By design the other windows in the cabin serves no purpose for lookout doctrine. They only provide day time natural lighting in the cabin. The forward left seat which is utilized for clearance is the troop commander seat, the two cabin seats which are used are troop seats. The only clearance for the crewmember is the crew door. The MOTT crewchiefs have been utilizing the troop commander seat window for clearance, however the nacelle in HELO, Conversion, and APLN mode blocks the left side clearance. The two troop seats are used as well, however, there is a blind spot from approximately 4:30 to 7:30. When attempting to clear high level traffic it is impossible because the top of the crew seat impedes the bottom portion of the window stopping the crewmember from kneeling down and trying to look up. On night vision goggles the crewmember FOV goes from 188 degrees down to 40 degrees FOV (Field Of View) making lookout doctrine even more ineffective. If the aircraft is used to carry troops with there gear as design the crewmember will only have his four inch window on the right crewdoor to make clearance calls from. The MV22 has downward stroking crash attenuating seats which does not allow troops to place gear under the seats. This blocks the entire cabin so that the crewmember could not get to the cabin windows for clearance. The ramp was utilized using a cargo strap for added safety. This was not a viable solution because of the empennage block the high level clearance and excessive "G" forces was placed on crewmember laying down.

By the doctrines and principles of Defensive Manuvering the MV22 will easily be defeated because it would be clear to any aggressor that the crew does not have good lookout.

This was a very frustrating flight because of the crewchiefs inability to provide the pilots with vital information regarding the aggressors location. Situational Awareness and Crew Coordination was dramatically low because of the inability to provide constant updates for the wingman and aggressors.

Poor FOV and excessive movement to try to clear aircraft.

Poor performance of the ECS, cabin is very hot and has no air circulation

Excessive G's from defensive maneuvering cause stomach sickness, light headness, and vomiting

Lack of ability to hear aircraft crew-alerts and the threat alerts reduces situational awareness.

Constantly standing while attempting to clear is very uncomfortable on long flights

There are no hand-holds in the cabin, this causes crewmember to get bounced around in the cabin. Several seats have been ripped by crewmembers utilizing seats as hand-holds.

Excessive debris coming in the cabin is abrasive to the face and skin during landings.

Coanda's not working makes cabin very hot during landings and while on the deck.

It depends on the gear the peronel have. If they have parachutes it can be very uncomfortable. The temperature was very high. This can cause air sickness, especcally with no outside horizon to focus on. 2

Seats were unacceptable. 2

Areas considered: Air sickness

There is just no room for operation, as mentioned. 2

Air sickness very bad. Seats were comfortable hoever. 2

Due to the fact that we were seatbelted to the deck of the aircraft, no comforts were afforded. 2

Air sickness is an issue, too small Area!! Everyone is sitting on top of each other. 2

Too confined of area in seats with gear - can't reach seatbelt harness with gear on. 2

The seat belts won't fit the Marines with parachutes on. They are too tight. The buckle isn't all that accessable either in the event the bird was to go down in the water. I feel there should be some more windows in the acft. 2

Again, just the amount of space (or lack thereof) is my only complaint. 2

S-9 Results

need to make seats bigger and more room for or packes to fit	2
People are still getting sick in the rear - we also cannot see where we are going or which way we are oriented to the LZ. Need visual because compass is not enough.	2
After having completed almost fifty static line jumps, several hours and evolutions, I never felt sick on any aircraft until the V-22 (sat in rear).	2
Areas considered: Air sickness	
Since there are no portholes to look out many people got airsick on the bird. We could not see outside to tell what LZ we were in.	2
Areas considered: Air sickness	
The noise, cramped space and temperature already mentioned in question 6 can prove to make a V-22 ride very uncomfortable and long.	2
There was a strange pressure differential which was making everyone's ears hurt. I did not get sick, but most people did.	2
The aircraft seemed to have more turbulence than others. The aircraft could not accommodate a 12 man stick of Marines with packs comfortably.	2
Areas considered: Air sickness	
It will depend on the amount of gear the passengers are carrying. I didn't get airsick, but the ride was bumpy.	2
MY A/O GOT SICK BEFORE WE EVEN GOT INTO THE FLIGHT GOOD BECAUSE OF THE HEAT AND THE MANEUVERING.	2
The seats and seats belts are not condusive to combat loads. Can't store gear under seats. The release latch needs to be redesigned. If aircraft goes under water the PAZs are not stored to stop from floating.	2
not enough space to breathe.	3
Areas considered: Air sickness	
The jumpers could not avoid getting airsick.	3
Areas considered: Air sickness	
Just not enough room for combat loaded troops.	3
Seating and passenger room for equipment could be crowded. This could cause long durations at the LZ.	3
It was too small of space with # of Marines in there.	3
to small fuseloge for combat equipment	3
Too hot, not enough free air flowing through the cabin, makes passengers uncomfortable.	3
Areas considered: Air sickness	
Its to tight inside, the seats should be further apart from left to right and front to rear, I never got air sick before I rode the V-22.	3
1. Air sickness has been a problem in the cabin. When the cabin is closed there is very poor air circulation. 2. Rapid descents does cause ear blocks. 3. Brown-outs cause cabin brown-outs and potential damage to electrical and mechanical systems	3
For any long range missions the passengers could very easily feel air sickness, due to nothing to look at in the back. (WINDOWS). Also with the crash worthy seats and not being able to stow anything underneath, grunts with full packs and gear will have to stack all the gear in the center isle. This is a serious safety of flight issue!! Ditching an aircraft in the water would kill everyone in back if the troops had full packs on board.	3
Air Sickness is big because there are no windows to look through.	3
Areas considered: Air sickness	
There is not relief system on the airframe. Piddle packs alone are not the answer.	3
It is comparable to a flying AAV.	3
Areas considered: Air sickness	
For the crewmembers in the back of the aircraft, it is extremely tiring. They are continually straining to remain standing in order to be able to clear the aircraft and search for SAM's, bogies, and AAA sites. The port holes do not allow proper/easy visual outside of the aircraft, forcing the crewmember to squat or bend while fighting against G forces applied during defensive manuvering. ECS is not acceptable due to the fact that the crewmembers in the back are exsessively hot during summer months and freezing during winter months.	3

S-9 Results

Comm between pilots and aircrew was fine, BUT only the ICS station at the jumpseat receives APR interrogation audios. 3
Unfortunately this leaves the observer totally unaware of incoming SAM's and possible AAA sites, UNLESS his eyes are in the cockpit. With this he is definitely not performing his duties as observer. ALSO, at these other stations in the back the crewmembers can not hear audio CMS warnings, which are very important to crew coordination. For the crewmembers in the back of the aircraft, it is extremely tiring. They are continually straining to remain standing in order to be able to clear the aircraft and search for SAM's, bogies, and AAA sites. The port holes do not allow proper/easy visual outside of the aircraft, forcing the crewmember to squat or bend while fighting against G forces applied during defensive maneuvering. ECS is not acceptable due to the fact that the crewmembers in the back are excessively hot during summer months and freezing during winter months. All of the se factors directly contribute to a great lack of crew comfort.

When landing in a desert enviroment the air crew is blasted with sand, and the cabin gets covered in sand. 3

if we had pax onboard during an actual enemy assault the crew chief would not be able to see any approaching bogeys or bandits 3
because we do not have adequate windows in the front of the cabin to maintain a good lookout doctrine. We also need more air conditiong in back because the heat and the lack of visibility can cause vetigo and air sickness especially for grunts who are not used to pullings G's or fast high angle of bank turns, they could get sick enough so it could limit there ability to perform there job in a hot LZ.

ECS dosen't work properly so troops in the back will be fatigued and nauseated from the flight, this will render them useless for the 4
mission which they are to perform. The troops are also packed in very tight with their packs which enhances the heat in the cabin and reduces their ability to entery and exit the aircraft in expediant manner

Air sickness may depend on the marine, but it's not a major concern. The major concern is fitting the packs and deuce gear in the narrow 4
seats.

A few troops became air sick, but not an unacceptable number. 4

Areas considered: Air sickness

Very good w/o packs, but with packs it becomes ineffective. 4

It would have been nice for the crewman to lower the ramp. 4

More windows necessary to prevent airsickness. Flight profile very different from Helos. 4

Areas considered: Air sickness

Most of us were experiencing air sickness the first time (2 wks ago) but this time there was far less of that. 4

Once hatch and ramp are secured, it felt like you were in a dungeon dark, warm and a bit uncomfortable. No Lt's on first stick got sick. 4
We remained at low enough of an altitude that no ear blocks were encountered.

Some members of my stick felt queezy and one threw up. 4

Areas considered: Air sickness

Will be tight. Less comfortable for longer flights. Air Sickness is a concern for whatever reason. 4

Areas considered: Air sickness

The aircraft is very hot in hot climates and very cold in colder environments. The ECS system does not adequately condition the air in 4
the cabin as well as the cockpit, in turn causing the aircrew in the back to be more uncomfortable. The ECS is very unreliable more in conversion mode than airplane mode where the vibrations cause the sdc duct leaks and ECS must be secured.

It would be hard to get a whole D.A in one bird w/ all our equipment. 4

Vetigo is greatly increased for the aircrew in the cabin when the cockpit door and cabin crew door are both closed. 4

the cabin too small 4

The cabin is to tight for for 24 troops and full packs to be comfortable at all, the ECS does not work for crap and it gets bloody hot and 4
miserable in the back. The troops get nauseated and then their SA is all screwed up for the mission.

Most troops experience some degree of air sickness. 4

Areas considered: Air sickness

It is hard for the V-22 to maintain a comfortable temperature suitable enough to satisfy the aircrewmn as well as the passengers in the 4
cabin area. It is either to hot or to cold. The temperature when it gets too hot creates a higher risk of getting air sick.

Areas considered: Air sickness
Ear blocks

S-9 Results

CABIN PORTHOLES ARE TOO LOW AND ARE TOO SMALL TO PROPERLY/EASILY ACT AS OBSERVER WITHOUT FATIGUE. ECS IS UNACCEPTABLE, DOES NOT WORK PROPERLY IF AT ALL. ENVIRONMENTAL CONTROL UNIT DOES NOT WORK SATISFACTORALLY, IF AT ALL. CREWMEMBERS IN CABIN ARE EITHER TOO HOT OR TOO COLD. CABIN ICS DOES NOT RECEIVE AUDIBLE WARNINGS.	4
ECS is unable to maintain proper cabin temperatures. This induces air sickness even easier.	4
Need some type of comfort pallet for long range flts. E.G. a pisser and water.	4
Seats, seatbelts, and air conditioning would all contribute to make a long range mission very uncomfortable.	4
Most problems on this AC in this area are the seatbelts. Combat.	4
The biggest factor in troop comfort is the seat design, otherwise the acft is pretty reasonable although slightly cramped when rigging equipment and conducting pre-jump checks.	4
Need some type of comfort pallet for long range flts at least some type of piss tube.	4
For a long range acft, there are few provisions for maintaining the force. Install a piss tube. Provide some sort of ventilation (heater and fan) for the cabin. The cabin noise level was acceptable.	4
For operational flts less than 1 hr. its is adequate however realistic operational flt will most likely be longer. The following items need to be provided; urinals, more options for securing (floor loading) equipment.	4
Seats and seatbelts unsuitable previously addressed.	4
Seating is very tight with combat equipment. There is no place to place rucksacks except in the middle of the aisle (legally) placing equipment underneath the seats would alleviate space and emergency exit problems.	4
Need a pisser. Cargo compartment cooling system is unsat. Seat too small. Seat belts need to be replaced w/ standard Air Force Q-release belts.	4
the ecs is very ineffective in keeping and maintaining a comfortable temp in the cabin which leads to airsickness	4
It's pretty comfortable but like I said in the other question, there is not enough room we don't care about safety	4
Troops, especially those in the rear are subject to air sickness.	4
Areas considered: Air sickness	
Cabin is too small to permit loading of crew, weapons and packs, much less with an additionnal load of special mission equipment.	4
due to tight seats, the seatbelt is hard to maneuver. The space is way too tight.	4
Crew chief was trapped up in front due to all of the gear in the aisles. The only way he could go aft would be to climb over all of the packs/equipment.	4
there is no room for gear like packs, crew served weapons, etc. This make the seating very uncomfortable.	4
I think it will take a little bit of time to get used to the ride in the V-22 because it is different than the CH-46 and 53. I felt more movement in the air, especially when we went from rotary using to fixed wing. My biggest suggestion is to widen the passage way between seats to enable the Marines with their gear to get in and out of the bird quicker.	4
too small	4
The flight caused two marines to have air sickness. The spce inside the V-22 is not large enough to adequately accommodate combat loaded marines larger than a rifle sound without jeopardizing lives in a combat zone due to the time to load/offload troops.	4
Areas considered: Air sickness	
Not much room.	4
Again, we were all over each other and if the crew had wanted to get to the rear for some reason they would not have gotten there.	4
the cargo area with its lack of windows is prone to causing airsickness. Furthermore, it does not provide the unit leader with much situational awareness when he hits the deck. The compass is a good start.	4
Areas considered: Air sickness	
Air sickness very common among those who usally do not get sick on a 46 or 53.	4
the helo seems to be flying with the front end up and the back end propping down (wheely). It would also feel like it was falling out of the sky.	5
Areas considered: Air sickness	

S-9 Results

No sickness and comfortable.	5
seats uncomfortable in full combat equipment	5
THE CAPABILITY OF THE V-22 TO KEEP THE CABIN AREA COOL IS POOR WHICH IN TURN MAKES YOU MORE RESEPTIVE TO AIR SICKNESS.	5
the bird moves around in flight I.e. quick jolts to the left and right	5
the ecs is inadequate at times in the back. The only time it is effective is when airflow is reduced in the cockpit to 35% or below	5
Areas considered: Air sickness	
Air sickness can be controlled with use of meds (I.e.) meclizine HCl. Gar blocks always use HPD.	5
Areas considered: Air sickness Ear blocks	
desending to fast not thinking about passengers	5
Definitely needs some type of apparatus to allow hydrated passengers to urinate.	5
Nothing different from this A/C than others in this area.	5
I got a little disoriented in the back which led to an uncomfortable feeling. This was not a huge problem though. One passenger did get sick and vomitted during the flight.	5
Equivalent to any special mission acft I've flown on. Put a urinal/piss tube on it and you'll get an at.	5
Due to the lack of experience I can't give an accurate answer, but it appears to attain the potential to effectivley support troops. The sealing needs to be cleaned up (padding sags and battery box is in a bad place).	5
If the V-22 was used to transport just civilians out of an area, it could be effective.	5
the aircraft defintely moves faster and is more maneuverable than a 46. This can cause air sickness and sinus problems	5
It was crowded with packs in the bird. We had to put them in the aisle. Barely any room for our legs.	5
ECS is unable to maintain proper cabin temperature. This helps increase likelihood of air sickness.	5
Somewhat smooth ride, much faster than helos, amazed at how fast and smooth the V-22 can exit from an LZ.	5
Quieter than most turbine driven acft. Inside the cabin. Could hold conversation w/ out yelling. Seems like the cabin would be very uncomfortable if the temperature was much warmer than today.	5
Areas considered: Air sickness	
Good.	5
I got no air sickness or any other discomfort fo that kind. Nevertheless, too much vibrations and a lot of noise and I felt like the ear block were sucking in my ears.	5
Once again seat belts need to be addressed (unsafe and uneffective) can't reach seat belt latch and catches on gear.	5
this aircraft is capable of gaining and dropping altitude very quickly. So air sickness maybe a problem. Also 15 passenders are not aware of ear blocks and don't clear. Those could be hazardous this could be covered in safety briefs before flights	5
same as any damn bird	5
Lack of windows made for a bumpy ride in the dark. Not having a forward horizon to watch made some passengers feel a little off.	5
I felt no air sickness, though a lot of noise.	5
Its going to be very tight.. Very close..and climate control will be critical to troop comfort. I would stop saying in the safety brief that most or any troops get airsick. It becomes a self-fulfulling proposal in many cases. That's before riding should be warme to outfit themselves w/ plastic (small) trash can liners to deal w/ airsickness. Already close, if a Marine gets sick in the cabin, its lickely to push others over the edge. Going on a long range / long duration should begin w/ troops vomiting all over each other in the A/C.	5
I wore ear plugs, and that seemed to offset any pressure changes.	5
The aircraft seems a little more unstable than the CH-53 and CH-46.	5
Areas considered: Air sickness	
On our short flight, no sickness was reported. However, ear blocks were reported.	5
Areas considered: Ear blocks	

S-9 Results

IOC's second flight aboard the V-22's was not accompanied by the same air sickness experienced during the first flight.	5
The V-22 is a rough ride, and those marines who have a weak stomache will probably get sick, especially in the back.	5
Areas considered: Air sickness	
Still provides a rough ride with no windows to watch changing horizon.	5
adequate # of seats, no problems.	5
it was smooth ride. I didn't get air sickness or ear blocks	5
No one experienced air sickness this flight.	5
Some got sick.	5
Areas considered: Air sickness	
The aisle way could be alittle bigger, coming in with large amounts of equipment and trying to let the crew chief stay mobile could be a problem.	5
Individual combat seating is perfect.. However, the seat belt release needs to be of easier accessible limits, and free from gear. Maybe at a higher level around the chest ro shoulder level.	5
Only short flight were taken by myself but it appears with doors and ramps closed MV-22 is quit comfortable.	5
four became airsick after 45 minutes.	5
Areas considered: Air sickness	
We conducted the fastrope ops wearing CQB gear without breaching tools and other gear we'd normally carry. Space is tight, I'd be interested in seeing how a platoon would fit inside the MV-22 rigged for a combat-equipment jump, or with rucks rigged for a deep recon mission.	5
Confines of the cabin significantly reduce PAX comfort, particularly with full mission profile equipment/in sertion requirements. Seatbelts do not allow for heavier/ bulkier combat equipment/load-outs for full mission profiles. Very little room to potentially treat casualties upon extract of a platoon size element (20PAX).	5
the marine did not get airsick nor did any of the marines on his flight. An overall smooth ride. The enhanced speed , maneuverability, and landing capablilityes were noticable	5
Some LTs got airsick, but overall, it feels like being in a small aircraft (Cessna).	5
The seatbelts were poorly desiged when wearing gear. You can't find the quick release in time if you had to doa nd emergency extract.	5
I like the transportation, it was fast and smooth, but the room is to compacted	6
I was fine. The aircraft can use more windows in order to allow marines the ability to see the LZ and surrounding area in order to allow orientation for when we exit.	6
I felt no air sickness, and it was very quiet inside the aircraft.	6
So smooth I slept for thirty minutes. I did need more leg room. Flights over an hour, with gear on the floor, will be uncomfortable.	6
Ear plugs will be needed but no notes of airsickness throughout platoon.	6
I did not feel sick at all.	6
I don't know if the vehicle is equipped for NBC, BVT Vehicle was comfortable and warm.	6
Needs more windows for observation. It will also give that stick leader a warm and fuzzy on where he is along the flight and can also give good reference pts. In case of survival situation occurs.	6
nice smooth ride, a little quieter than ch-46 or a ch-53	6
I had no problems clearing sinus or nausea	6
Earblocks are normal for anyflight, other than that it was good.	6
Areas considered: Ear blocks	

INP05: Rate the adequacy of cabin seating in the V-22.

Comment	Total Responses	151	(Avg.) 3.7
the suspension seats are a good idea but space and seatbelts are a big problem.			2

S-9 Results

There is not enough room for full combat gear and personnel.	2
the v-22 seems more cramped for space than the 46 or 53. The packs and crew served weapons	2
Very uncomfortable ride	2
Again, the cabin is not only too narrow, and the seats are entirely too small and too close together. We felt like we didn't have enough room to sit comfortably next to each other. We also couldn't fit our packs in front of us without stacking them in a cluster (leaving no leg room).	2
it was more comfortable but too close together	2
Individual seats are comfortable for personnel w/o equipment, but as demonstrated w/ either parachute gear or assault gear, the red cargo aircraft bench seats provide more room for personnel. In addition, room underneath the seats must be available to store additional equipment.	2
I like the seats but not the belts.	2
wasn't built for combat troops. Seats too small with gear on. The 782 gear, gasmask case	2
WEB hinges on sides of seats interfere w/ equipment. Velcro straps pull off easily. Inability to store equipment under seats severely restricts operational capability; it limits amount of equipment that can be carried. Install standard web seats.	2
The seats are entirely too close together and there is not enough room for packs and additional gear.	2
Compartment very tight hardly no room for packs; not to mention any additional supplies.	2
Very cramped. So much so, that packs were stacked w/ 3 on top; very impractical if expedience is important. The seats are barely deep enough to sit in with a full backpack.	2
Bucket seats too small for combat gear.	2
Side straps that hold seat level can catch on flaps of parachute container. Seat belts as installed on aircraft are 100% ineffective attaching standard C-130 seat straps helped. The current seat belts catch on rip card handles and are impossible.	2
No room for gear or packs.	2
its nice having the individual seat. Your seat belts right there	2
With full combat load.	2
Already mentioned 3 other times.	2
Seats are comfortable. Even with deuce gear on. Seatbelt was hard to work with. Female end fell beneath the seat and the male end got caught on my gear.	2
See #3.	2
Too small to sit in w/ backpack.	2
Very narrow seating.	2
Doesn't accommodate troops w/ equipment.	2
Too cramped, with packs it is virtually impossible to move fast. With combat gear, it is still a very slow process. Seats spaced apart lengthwise would help.	2
Seats too small and close together, with all the gear on, was very difficult to sit down.	2
Seats too small for a combat equipped soldier. Even a slick soldier does not have enough room. Seatbelts unsafe, shoulder strap hooks equipment, buckle too far over on side. Extremely dangerous for emergency evac!	2
Seating in the V-22 is cramped with light gear and intolerable with packs.	2
Very difficult to find seatbelt in a timely manner.	2
The seats do not allow for Marines with equipment. We had to stow seats in an upright position and sit on the desk of the aircraft.	2
Both getting into the seats with packs and 782 gear is tight and crowded. Once seated, the seats are quite comfortable.	2
there is no room for combat loaded troops	2
seats too small for marines with gear seatbelts catch on gear	2
Seats need to be larger to seat combat ready marines.	2

S-9 Results

seats are not large enough to accomidate a combat equippped jumper	2
jump without gear the seating harness system not large enough	2
The seats are not wide enough to allow for the person's 782 gear. We were sitting on top of each other.	2
It seems that with all the new technology and gadgets, this most important aspect was largely forgotten.	2
Seating without packs would most likely be alright. Seating with packs is very tight.	3
I believe a bench seat would be a better option. A bench seat allows fewer people to lay on the seats, and more people to sit closer together to increase the number of people who can sit on the AC.	3
Troops are crunched together; provides for less movement on the V-22.	3
Not enough space.	3
bucket seats are to small , acuared to sit with full combat gear on	3
the seats are very narrow and shallow. This results in Marines getting out into the vents of the AC and wedged tightly together.	3
Sitting on the seats with the ML-5 parachute was impractical. We had to sit on the floor due to the size of the parachute and the gear.	3
For the amount of jumpers the V-22 is capable of holding, the seats and space are not adequate for a person with a chute to sit on.	3
Same as above.	3
Seats too small, uncomfortable seating with combat load.	3
Seating for paraops is more effective on the floor. This is not a problem in itself except that more tie downs are needed along the floor to ogger a better seatbelt pattern suggestion: Use some type of clip in harness that offers mulitple tie downs along the floor.	3
no room for packs and feet	3
The seat size combined with the difficult seatbelt slowed the onload of marines.	3
The individual seats were hard to get into with gear on.	3
Once you got strapped in you were fine, but that process took awhile. There is not enough room with all the gear, weapons and bodies.	3
With your gear on there is not too much space to maneuver.	3
need more room	3
The deck mounted seatbelts neet to be modified. The main problem is that they are not long enough to facilitate a person with a pack. The seats are also too small.	3
Limits ACL - must stow individually - uncomfortable bar under legs that blocks circulation. Recommendation: Use bench type seating. (like in chinooks).	4
Seating is very tight w/ combat equipment. There is no place to place rucksacks except in the middle of the aisle (legally). Placing equipment underneath the seats would alleviate space and emergency exit problems.	4
Once we were on and loaded, we were okay for the most part.	4
Still not enough room.	4
The seats would be a little better if there was not a metal bar right underneath your hamstring area. Over long periods of time circulation is cut off to your legs.	4
The seats are all one size - people come in many shapes and sizes making the seat comfortable for some - uncomfortable for others. I think a bench style seat is better you can cram more personnel and equipment in, and you can fold it up and out of the way all at once.	4
Seaitng to cramped - hard to adjust gear, seatbelts, etc. Took a little too long for everyone to get seated and strapped in.	4
Seating becomes a process that is drawn out due to all the gear we wear so the aircraft sits in the LZ longer and these become a target.	4
The seating was very cramped with the 782 on and there was minimal room for packs. Very cramped and very difficult to move.	4
Seats too small for Marine carrying 78Z Gear.	4
marines with full load of gear, wearing a parachute, would not be able to use these seats , due to there size	4
Seats too small for Marines with LBV/Buttpack seat belt system complex	4
Seats are too small for LBV and Buttback. Seat belts are difficult to manipulate. No underseat storage.	4

S-9 Results

its too small	4
Smaller and narrower seats than helos. Harder to fasten seatbelts.	4
Beach seats.	4
Not enough space between rows on seats - cabin seating does seem to be safe though.	4
Although the seating is shock absorbing and numerically adequate for a squad of marines, the space available for packs and gear is ineffective.	4
It was a tight fit. The seatbelts were easier to fasten in the V-22 than the 46 or 53.	4
Seats were fine but aisle way was too narrow for full packs.	4
Need more play in the seatbelt. There was not enough slack to secure the belt when wearzwo an LBV with a full buttpack.	4
It is too close together, making belting difficult and very time consuming.	4
Seats were to small , our 782 gear was bulging to the sides making it difficult for the marines to get seat belts on.	4
The seats are too shallow for anyone who has equipment on their back (parachute,rucksack, etc.)> They are workable for short periods only. The support straps on the sides also interfere w/ equipment which is wider than the person using the seat.	4
We had 8-10 pax, it was very tight. The seats are to small, if you have any kit on at all. Could not use seats w/ ruck, had to sit on ruck on the floor which made things very conjested w/o consoles.	4
Should have made more room for gear.	4
There is not enough room to fit 24 Marines with a combat load.	4
As stated before, with all the marines with their gear, the seating was very uncomfortable.	4
The 24 packs that were loaded onto the V-22 were stocked on each other and were difficult to offload.	4
Seats are too narrow for the average marine with 782 gear inc/ flate and weapon.	4
Individual seats are not as effective as bench seats. W/ all your equipment on you will take up a seat and a half. The velcro hold seats up is ineffective. Also if an individual forgets to put his seat up on a night infil that could cause problems. Either install standard AC bench seats. Or maybe the same style of seats can be made into a four person bench seat.	4
The seat design does not work for an MFF jumper, w/ or w/o O2 and combat equipment. A bench type hanging seat would be better. The individual seats are too narrow for an MT1XX parachute. The support straps on the seat catch on the parachute AR2, O2 bottle, and the jumpers radio and weapon. Floor seating was effective for 9 pax. There was adequate room for the O2 tech to move among jumpers.	4
not a lot of room, very tight.	4
tight with heavy packs	4
Seating was to close, had to take off the gear to sit comfortably.	4
The seats are not large enough to effectively and safely seat marines.	4
The seating is comfortable, but the seatbelts are awkward and do not stretch far enough to work properly. The cabin is tight and does not have enough portholes. This reduces situational awareness.	4
a primary concern the seats while perhaps safer are smaller and the aisle is smaller making loading and unloading difficult and possibly dangerous in a situation with loaded weapons	4
Very little space in the cabin.	4
Discussed in Question 9.	4
The seating is effective although cramped which inturn makes it a bit difficult for safety reason in a bucking your safety strap.	4
Much safer but too crowded.	4
Tight elbow-to-elbow, nothing you can do about that if you want to keep sitcks of 24 as the norm.	4
Seats too small.	4
The passage is too narrow with fully loaded Marines.	4
We need more room for packs.	4

S-9 Results

Seats are too narrow. They do not allow for someone w/ full kit or battle gear. Not being able to store equipment under seats will end up fatiguing the passengers because equipment will be on their laps or in front of their feet. Bench seating would be much better.	4
Individual seats are not as effective as bench seats. An assaulter w/ all his equipment on will take up a seat and a half. Also during real world ops. The ability to put store equipment under the seat will be a must.	4
There is no room between passengers to grab the seatbelts behind you. There is also no room for our packs.	4
I like the seat design. Although they should be a little bigger, the seat belt need to be made from a different material so they will not twist.	5
too close when you have full deuce gear on	5
Seatbelts won't go around a combat rigged jumper.	5
Effective for what it was designed for.	5
As long as there are no packs involved, seating is comfortable.	5
marines sit too tight with gear.	5
Effective but small, no room.	5
If seat belts are replaced w/ standard AF seat belts and support straps on the side of each seat are removed or modified the seating will be much better.	5
The seating or space to sit is adequate.	5
seats are good.	5
Seats are a lot better than a 46 or 53.	5
The seatbelts attached to the tie down rings were ineffective. Use of space w/ that setup took up too much space and at some pts. Connections could not be made. The AF seat belts on the seats were very effective and met the needs: ease of on and off and security.	5
Seating slightly too small	5
Seats were comfortable, no leg room due to all of the packs in the passageway.	5
the seating is to enclosed area. The seats are too small for a marine and his gear. The seatbelts are not long enough	5
Need to change out seatbelts and change the attachment pts. Of the emergency blow out handles.	5
Seats comfortable but weak.	5
Small cramped fit in cargo.	5
Better without packs on board.	5
The new seats are great, except for the seat belt. They are (the seatbelts) too flimsy and in any case that required quick responses, the seatbelt would probably not be used by me. One idea, make it retractable or make it stiffer.	5
Once in a seat, there is really no problem.	5
Wearing gear made it difficult to find seat belts. Packs were sitting on top of our legs.	5
The seats don't hold a Marine and his LBV comfortably next to the Marine on his left or right.	5
Seats are a little small and when sitting with 782 gear on your body, it's kinda hard to get all the way in the seat.	5
With the proper amount of gear, the cabin seating is adequate.	5
w/ the current seats, we can not fit more than 18 fully equipped assaulters. An assault troop, w/ its direct support(commo,medic,EOD, and CCT) will not fit in one acft. A saber SQ will require at least 4 A/C. We can fit more in by sitting on the floor, but that won't work for long flts.	5
The seats need to be wider to allow sufficient space for marine and combat load, that is, LBV Pack.	5
Seats need to be modified, side support straps for each seat need to be modified or removed.	5
Nice and comfortable seats.	5
the cabin seating is good, if packs aren't included. If they are included, reduce the amt of troops.	5

S-9 Results

Its cramped, but because these individual seat it will be more difficult for the troops to adjust to the crowding in the cabin the way they could w/ the old bench seats. The seats are comfortable enough but w/ 24 troops all wearing combat equipped LBV's, its going to be very tight.	5
We easily fit 24 Marines on with weapon, LBV.	5
The seatbelt buckles need to be bigger.	5
Too small very difficult to occupy with all of our combat gear. Seats too narrow, seatbelts too small, impossible to manipulate the gear.	5
Comfortable w/deuce gear, add packs, crowded and uncomfortable.	5
VERY CRAMPED! The only way to effectively sit with any type of room was to put packs under seat, which is not allowed anyway. Crew chief had to crawl over packs to get to his position. The seats were kind of small as well. It was difficult to sit with butt packs.	5
The seating is a much needed improvement the ability of the seat to take the impact is good. Possibly more room between the seats though.	6
Seats are extremely effective for lightly loaded troops. Safety considerations are outstanding.	6
Enough space for sitting up and very comfortable.	6
much more room without packs.	6
Good - but need new seatbelts.	6
The seat is comfortable and has enough room.	6
Seats are good; the seat belt is a problem.	6
Tight fit.	6
it's but okay.	6
There is enough cabin seating and I am glad they have the shock absorbing feature.	6

INP09: Rate the usability of seatbelts in the V-22.

Comment Total Responses 140 (Avg.) 3.8

They are too difficult to strap into. We need more space to slide into the seatbelts.	2
Difficult to operate. The buckle is simple enough obviously, but with gear on, it is difficult to locate the female end.	2
Good idea but might take a while in an emergency.	2
The seatbelts need some work, perhaps making the female end longer. Too much searching for you belt.	2
Already mentioned.	2
the cross-shoulder seatbelts of the V-22 while undoubtedly safer than lap belts are too difficult to get in and out of.	2
Seatbelts suit personnel not wearing any gear and need not make a quick exit.	2
Need to make the female end longer.	2
Hard to adjust and snap together with gear on. The straps are hard to find with all our gear on and with the straps adjusted all the way out, they are very difficult to work.	2
Took too long to put on shoulder harness, lap belt is just fine, it is also faster to put on.	2
Very difficult to find with gear on.	2
buckle strap needs to be longer.	2
Seatbelts too hard for someone wearing gear to fasten.	2
I couldn't get the damn thing on because it was to tight	2
not good they need to be longer	2
Do not need the shoulder strap	2
Good for safety but not for exit.	2

S-9 Results

They are difficult to fasten. Many were not able to find or fasten the seat belts.	2
The seat belts integral to the acft (lap/shoulder) are great for personnel w/o equipment. W/ the increase in size and bulk of personnel w/ MFF and / or assault equipment, the belts become nearly useless as they are not long enough to fit around one.	2
Once on, the new shoulderstrap seemed to provide more safety than a simple lap strap. However, it was much too difficult to get in and out of them in a timely manner.	2
male end of belt kept sliding down belt itself so you could not reach it with all of your gear on and packs; it was very difficult to secure them.	2
Catch (snag) on the gear to easy.	2
Because the seats do not allow a man with a chut to sit in them, we were seated on the deck. The seatbelts that were used were ineffective because of their shortness and position	2
The "male" end of the seatbelt needs to be fixed so tht it doesn't fall down to the deck when you try to put it on.	2
Buckels need to be bigger and strap needs to be wider.	2
too small, by going across the chest they catch on gear	2
Unable to get seat belts on with ease under a combat load.	2
The belts are not long enough to stretch across a person with 782 gear on.	2
Can't reach buckle to latch or unlatch and diagonal strap catches on gear, need standard jump seat, seat belts.	2
if you can get the seatbelt fastened it works well. It is very difficult to fasten the seatbelt with gear on.	2
Limited access to comms, and even if we could get to them they are not compatible w/ our equipment.	2
Seatbelts need to be adjuste and longer to seat marines with gear.	2
Seat belts were not long enough.	2
shoulder harness are not effective in the feet they will get fowled on all of our gear	2
The shoulder strap is a good idea, but just something else to get in the way of the gear that we wear. Some had trouble getting in and out in a timely manner.	3
its hard to put on also gets caught on your gear	3
Difficult to handle small belt buckle with gear, weapon, pack in lap, gloves. Should be bigger, however, I liked the fact that it was a shoulder belt.	3
The seat belts are hard to figure out and the female end is too short.	3
It is difficult to get them on with gear on, buckle is too small, shoulder strap gets hung up on gear something like this, that you got into like pack straps with a buckle in the middle would be better.	3
We had to use floor mounted seatbelts that were just barely long enough for a slick jump. With any equipment on they were too short.	3
Not long enough.	3
The seatbelts are still awkward and cumbersome. They should just come across the lap.	3
would not fit over 782 gear and M240G spare barrel bag. Very difficult to adjust and fasten with every seat occupied.	3
They are not long enough and they should be a simple lapbelt, not a car seat belt.	3
the female end of the seatbelt is too hard to get to. Needs to be bigger.	3
Buckles need to be bigger.	3
The seat belts in the seat are unrealistic for a marine with his gear on. For jumps the seat belts on the desk, they need to be longer.	3
too hard to locate the other end of the belt	3
Seat belts barely fit with gear on difficult to put on/off.	3
Seatbelt buckle to small and would be hard to buckle in during night due to the color.	3
seats don't seem to be designed for marines wearing LBVs; seatbelts are more cumbersome than CH 46 style.	3
They should be designed to be more easy to find when you're about to take off in 20 seconds and the enemy is firing at you.	3

S-9 Results

seat belts would not fit when I had all my gear on.	3
Too difficult to get on and off our gear will by the looks of it be in our laps.	3
Not enough slack, see above.	4
The seat belts were hard to put on. Female end fell between the seats. Male end caught on my deuce gear.	4
buckles need to be bigger.	4
needs longer female connection straps.	4
Too easy to get caught up in seatbelts.	4
The seatbelts are hard to fasten with a combatload - they need more slack.	4
Effective when once again, little gear is unloaded. When a pack and full combat gear is considered, the seatbelt is difficult to reach and connect. Be adjusted to fit if a large buttpack is used.	4
hard to fasten with narrow seats. Little elbow room.	4
I could barely figure out how the thing fit together. With practice, it could be easily figured out.	4
seatbelts could be longer, the female end. It was too difficult to fasten.	4
See above	4
Putting the seatbelt on is not that successful with a full combat gear. Also, leaving the bird Marines were getting snagged up.	4
hard to see and snap in.	4
It was hard to go around myself in full gear, seat belt needs to be redsuited.	4
Seatbelts not big enough to strap over deuce gear.	4
The buckles need to be bigger.	4
Brighter colors and too small.	4
we sat on the deck/ the seatbelts didn't fit around some personnel	4
Very hard to put on with 782 gear on, but the over the shoulder belt provides much better restraint.	4
After loading all the packs, getting the belts on was nearly impossible.	4
The female end must be longer and the male end more stationary.	4
I think the seatbelt would work well, however, it was very difficult to fit the seatbelt over myself and deuce gear in order to lock it in.	4
The wearing of 782 gear made the seatbelt difficult to fasten. That will probably be easier with more experience though.	4
Like the three point system. Just too flimsy. Numb hands and frozen bodies aren't going to be able to fasten them. They do seem to be a great design, but it needs to be a system that is faster. After being frozen in the field, I probably wouldn't be able to fasten it.	4
Hard to find female end the male side slides all over the place. What about one that comes over the shoulder and buckles in between the Marine's legs?	4
Belt is not long enough. Seat belt needs to be thicker.	4
Difficult to fasten.	4
As an aviator, I encountered a little problem reaching the connect/disconnect part of the belt. The Lt's were have a difficult time across the board - mostly because with 782 gear on and shoulder to shoulder with other Lt's it is difficult to maneuver to steep. This could be a problem and needs to be considered should an emergency situation arise.	4
Difficult to fit w/ buttpack.	4
They were difficult to put on.	4
needs to be bigger.	4
Seatbelts are not effective when occupants are wearing 782 gear.	4
the seatbelts are nto long enough for a marine and his gear to sit down the marines can be taking there gear in a combat situation	4
you have too much duece gear on to try to get the seat belt all the way around your body	4

S-9 Results

barely fits over gear, it tuff to take off in a hurry	4
can't use seatbelts right with gear on	4
While safer, very difficult to get over gear and buckled with any speed.	4
To complicated.	4
Hard to fasten with gear on, but I assume once we get more familiar with the belt, it will become easier.	4
Male end clip needs to be longer. Takes too long to access when in full 782 gear.	4
Should make the length of the seatbelt longer.	5
With only deuce gear, they are manageable.	5
Good idea w/ the cross shoulder. Hard to get over gear.	5
seemed very good and comfortable.	5
With shoulder strap, can't reach to ground to get ready to unload to grab things.	5
Buckle needs to be bigger.	5
The buckles should be a bit bigger to make them more visible and easy to handle.	5
Floor loading and using the seats were effective.	5
floor seat belts need to be able to connect to all D rings	5
If seatbelts got buckled it worked. If not it got tangled in geal towards exiting craft.	5
They twist too easy and fit tight on troops wearing gear.	5
It was a problem with them the first time on, but this time everyone seemed to be more comfortable.	5
Same as above.	5
Hard to put on.	5
Safety wise, they are excellent, but they are difficult to stretch over gear, even for med. Sized marines.	5
Helps get off the bird without difficulty.	5
It was hard to find the seat belt clip and fasten the belt while combat loaded.	5
They appear better than old belts once the passenger learns to operate them.	5
Good concept of the lap and shoulder harness. Its going to take a while for troops to figure out the buckls and quick..I thought I snapped mine in-place at last 3 times and each time discovered the buckle was not seated until I moved in my seat and the belt came loose. Also the quick rebase and the short length of to which its attached, drops down between, then beneath the seats. Retrieving the quick release portion becomes difficult if the A/C is loading. We should consider the quick release through a soft, plastic, semi-rigided quick so that the troop Marine can always find it in the same place and protrudes upward ot receiver the seat belt buckle.	5
With 782 gear on, seatbelts were difficult to put on and buckle.	5
the new design is favorable as far as safety, however, the fastening device needs to be adjustable and the prong inserted into receptacle needs to be longer...reference points.	5
The seatbelts were another good improvement. The only complaint I have is there was not enough elbow room to effectively and quickly buckle and unbuckle the belt.	5
A plastic device that holds the female end of the seatbelt in an upward position wiould be helpful.Combat loaded marines may have trouble getting the seat belt buckeled in a timely manner.	5
More safety than a 53.	5
Easily secured.	5
seatbelts were good in terms of securing the marine in his seat. The strap across the chest is good. However they are difficult to secure and and unsecure and marine can easily become ensnared when wearing full gera. In the case of a crash in water freeing yourself from this seatbelt could be a time comsuming and threatening process	5
Very difficult to adjust and fasten with 782 gear on. It took a lot of time to get them adjusted around all the gear.	5
Feel much safer but takes too long to buckle and unbuckle.	5

S-9 Results

They would work well in the event of an accident, but they are difficult to manipulate. Therefore, taking a long time to onload.	5
Shoulder seatbelt seems more protective than CH-46 waist seatbelt.	5
Still a little complicated. Would be better if they extended from both sides so they buckled in the middle. Difficult to find buckle near your side, while wearing combat gear.	5
The belts are difficult to snap when wearing the LBV and combat gear.	5
I feel much safer than in the 46 or 53, but it takes time to put it on. Once again, with practice, it can be quickened.	5
Much better idea in a cross-body, but very hard to stretch the belt all of the way out. This is needed to be longer so gear can be accomodated.	5
Over the shoulder belts are a good idea, people are accustomed to them.	5
Good restraints. Hard to put on though.	5
They were easy to secure.	6
	6
Too hard to get on and off.	6
I like the idea of the seatbelts coming over our shoulders.	6
The seatbelt system worked well. It made me feel very secure.	6
The over the shoulder seatbelt is much more effective in restraining.	6
Once the belts were on, they worked well. It would be helpful if you Added a longer end to the tightening straps and colored them bright orange to make them easier to find and handle.	6
I felt safe and once I figured it out it was easy to buckle.	6
The only concern is troops wasting time trying to remember belt over left shoulder or right shoulder.	6
Seat belts are better for safety then the seat belts in the 53 and 46.	6
The seat belts seemed slightly difficult to get on over where you have deuce gear on.	6

P-FS05: Rate the overall safety for embarked passengers.

Comment Total Responses 8 (Avg.) 3.8

Poor field of view. Cabin blue lighting not selectable from aft cabin. Non existant hand hold and gunner belt attachment points at fwd and aft cabin during troop lifts. Cabin non-skid slick during most conditions. Cabin non skid needs to be painted grew IAW 509 manual.	2
Seat belts are to small for fully equiped grond personnel thay don't give adequate room for them to hook up. They are also very difficult to use and get tangled very easy.	3
Passengers do not fit in the seats when wearing any gear I.e. flack jacket or a H harness etc. Cabin enviromental control is unsat	3
Cabin is small and the troops are packed in like sardines. The gear thy bring has to be put in the center of the cabin which in turn creates a trip hazard. Seat belts get tangled in their gear and are difficult for them to use.	4
The overhead aft emergency egress handle for the blow out window is in a very accessable area for troops egressing in paraops or fastrope, etc. The troops could grab the handle very easily as a hand hold while waiting to egress via fastrope, paraops, etc. Very unsafe if this would result in blowing out a window.	4
troop seats are to small, it is very hard for troops to strap in with full 782 gear on. Also not being able to put gear under the seats is avery big emergency egress hazard because there is no room to move in the aisle.	4
Ican understand having the upper ramp door closed during chaffe/flare operations, but I do not see why the upper crew door needs to be closed. It causes a problem with look out doctrine and it is almost impossible for the flares to make it all the way back up to the crew door. The left wing needs to be monitored for fuel venting during hard banks. Flares and JP-8 can make for a deadly combination.	5
Seats are smaller and do not provide room for the larger frame Marines, and cause crowding when fully loading the aircraft	5

S-9-2

S-9 Results

HF15: Rate the ease of emergency ground egress from the V-22.

Comment Total Responses 45 (Avg.) 4.0

The cabin is already difficult to onload or offload. Marines are packed together like sardines. If there was an emergency it would be hard to get everyone out. 2

Areas considered: Difficult to exit cockpit/cabin
Difficult to unstrap from seat
Easy to snag clothing or equipment while exiting

Ramp needs to go all the way down to meet the ground. 2

Areas considered: Difficult to unstrap from seat
Insufficient clearing through doors or hatches

People were getting their gear snagged by seatbelts. Cabin ceiling is too low and rear hatch apparently doesn't touch ground. 2

Separation from belt is not a problem. The only problem w/ egress is the crowded nature w/ 24 Marines on board. Marines will have to plan for this before boarding. 2

Difficult to unstrap from seat when wearing gear. 2

Areas considered: Difficult to exit cockpit/cabin
Difficult to unstrap from seat

Not enough exits points and the exit points that are there seem to be difficult to engage. 2

well if I wasn't wearing anything but cammies I could fit through the small hard access escape hatch 2

these problems could be remedied if the amt of troops were decreased. 2

Areas considered: Difficult to exit cockpit/cabin
Difficult to exit cockpit/cabin (comment)

As mentioned before, egress is hindered by seatbelts. 2

I don't know why the Marine Corps didn't look more into this bird, testing wise, before buying so many. 2

Areas considered: Difficult to exit cockpit/cabin
Difficult to unstrap from seat
Easy to snag clothing or equipment while exiting

Exits are too small to get out with gear on. 3

Areas considered: Difficult to exit cockpit/cabin
Difficult to unstrap from seat
Insufficient clearing through doors or hatches

Too small 3

Areas considered: Difficult to exit cockpit/cabin
Difficult to unstrap from seat
Easy to snag clothing or equipment while exiting
Insufficient clearing through doors or hatches

Need better seatbelts. 3

Areas considered: Difficult to unstrap from seat

Again, seatbelts and cramped conditions would prove hazardous. 4

Areas considered: Difficult to unstrap from seat

With the packs and weapons, this is very slow and it was difficult to unstrap. I would be very uncomfortable during emergency egress due to the rotors. I think windows were too small to exit though. 4

Areas considered: Difficult to exit cockpit/cabin (comment)
Difficult to unstrap from seat

Easy to snag gear. Simply not enough space. 4

Areas considered: Difficult to unstrap from seat
Easy to snag clothing or equipment while exiting
Insufficient clearing through doors or hatches

S-9 Results

I crashed once in a CH-46 and couldn't get out of my seat belt. We will experience in a MV-22 crash troops and unable to find the release on their seatbelts. But once released they will find it difficult to egress - especially through the sick windows which require the presence of mind to operate a explosive bolts and the requirement to more sections of seating out of the way. All this assumes we can get out of our seats, operate the windows, drops the seats blocking the windows, then exit the A/C if wearing LBV's ect. Through a fairly narrow aperture. We are going to need, on the groome skid, lots of practice in mock-ups a the GCE areas of loading/unloading and emergency egress. Obvioulsly on Ospry-checker has to figure into the equation somehow. 4

Areas considered: Difficult to exit cockpit/cabin
Difficult to exit cockpit/cabin (comment)
Difficult to unstrap from seat

Seat belts catch on gear. 4

in the opinion of this marine emergency egress will be a major problem for the v-22. As mentioned before limited space, restricted movement, awkward seatbelts and unforeseen factors will make the v-22 a deathtrap in a water crash where seconds count 4

The ramp never went all the way down. With 60 lbs of gear a two to three foot step up was almost impossible for the Marines to climb up. 4

Areas considered: Insufficient clearing through doors or hatches

Over shoulder seatbelts snag gear. 4

Difficult to unstrap from seat because its to tight.Not enough room. 4

We got a brief on the exploding windows; what about the crew chiefs hatch? How does that open? All the packs/gear stowed in the aisle would have caused absolute chaos attempting to egress. Gear needs to be out of the way or secured. 4

It is difficult to move on or off the V-22 w/ gear. 4

Areas considered: Difficult to exit cockpit/cabin (comment)
Easy to snag clothing or equipment while exiting

Safety straps hang on gear. 5

Areas considered: Difficult to unstrap from seat

The seatbelts were somewhat of a hassle trying to put your gear on and get out. 5

Areas considered: Easy to snag clothing or equipment while exiting

Again not enough room between seats for proper seatbelt buckle/unbuckle. 5

Areas considered: Difficult to unstrap from seat

This looks to be effective, especially without packs. 5

Seatbelts would have caused a problem. 5

Most of the negative issues regarding egress from the V-22 will be overcome through frequent training. Egress for pax in the back (especially overwater) is a major concern 5

Seatbelt difficult to unhook and clear from gear. 5

Areas considered: Difficult to unstrap from seat
Easy to snag clothing or equipment while exiting

You may snag on stuff when you have combatload on. Egress of the plane may be confusing with a new aircraft and no preflight safety brief. 5

Areas considered: Difficult to exit cockpit/cabin
Difficult to unstrap from seat
Easy to snag clothing or equipment while exiting

Gear packed on top of troops made exit slow and difficult. 5

Areas considered: Difficult to exit cockpit/cabin (comment)

The space restrictions taking into account gear, and weapons makes egress difficult. 5

Areas considered: Difficult to unstrap from seat
Easy to snag clothing or equipment while exiting
Insufficient clearing through doors or hatches

Again, the key factor is the gear we were carrying. With only 782 gear, we moved off with relative ease and quickness. Packs really slowed us down. 5

the emergency exits were easy to employ and they were big 5

S-9 Results

Width of Osprey is narrower than CH-46, thus offloading is slower.	5
Areas considered: Difficult to exit cockpit/cabin Insufficient clearing through doors or hatches	
Tight fit means passengers will build up in and block aisle upon egress.	5
Areas considered: Difficult to exit cockpit/cabin (comment)	
it is easy to get out of the cabin	5
All exits I think were good to go had no problems.	5
It was difficult to exit simply because the ramp wasn't completely down. The crew need to be sure the ramp is completely down because the troops need to have good traction because the 22's rotor wash is extremely strong.	5
Areas considered: Difficult to exit cockpit/cabin (comment) Difficult to unstrap from seat Insufficient clearing through doors or hatches	
Egress hatches appear too small to accommodate marines, gear and weapons - especially in water.	5
Areas considered: Difficult to unstrap from seat Easy to snag clothing or equipment while exiting	
Looks like it would be fairly easy once you have found buckle near your waist - would be easier if buckle was in front of you.	5
Hatches appear large enough to accommodate a Marine plus gear/weapon.	6
The seatbelt catches gear sometimes when you are in a hurry to get off.	6
Areas considered: Difficult to unstrap from seat	

S-9-2-2

ORD01: Rate the ability to safely load/arm ordnance on the V-22 (while on land, ship, etc).

Comment Total Responses 2 (Avg.) 5.5

Grounding wire clamps should be upgraded to larger size so proper grounding can be est. at installations were grounding pt connections are larger.	5
Very time consuming because A/C has to be shut down to load and download.	6

ORD02: Rate the ability to safely download/disarm ordnance on the V-22 (while on land, ship, etc).

Comment Total Responses 2 (Avg.) 5.0

Need to ensure that maintenance personel allow ord. Team to down load all expendables before working on the acft.	5
Same as above.	5

P-GS01: Rate the overall safety during aircraft preflight.

Comment Total Responses 13 (Avg.) 4.6

Inadequate access to inspect inboard and outboard (bottom) swashplate actuators during preflight inspection. This is especially critical due to the fact that if one of the swashplate actuator support dog-bone attachment links is broken, it will only be an estimated 5 hours until catastrophic failure (read: CRASH).	2
We cannot look at many dynamic components due to panel inaccessability.	3
aircraft has areas that are not easy to get to and we have to get in some unsafe postions.	4
aircraft needs to have more access panels, especially around the rotor control area and the heads.	4
Wish I could look at the engines in more detail and the proprotor hubs.	4
Pilot has no ability to view major components or system on pre-flt, first indications normally show up on pre-start or start checklist, resulting in missed launch times or missions.	4

S-9 Results

very hard to get stands to aircraft if in helo mode, have to depend on grdp when in helo mode also. Grdp does not allow you to notice overserviced conditions. Lack of written inspection procedures hinders inspection thoroughness.	5
The preflight is difficult in some areas (access to nacelles) the rest of the aircraft is relativity easy to get to. The only thing that really needs to be looked at are accessibility to more areas that should be looked on a daily basis, " IE" wing drive shafting.	5
current preflight procedures are relatively simple and quick, but recent problems may dictate that pilots and crew start opening more panels (especially in the nacelle area to visualize key components.	5
No off ground work required - very safe	6
No issues	6
No revelent comments.	6
For pilots it's nothing.	6

S-9-2-3

P-GS02: Rate the overall safety during start-up.

Comment Total Responses 18 (Avg.) 5.2

Fire bottle/hose do not reach the ht. Of the engine intake, APU. In addition current fuel boost pump problems can cause damage (Per flt clearance).	3
It smokes a lot out of the exhaust	5
The downwash is very strong when turning up and the crew has to be extremely careful of their footing.	5
False alarms are too common - pilots are "getting used to them" which could become a SA degrader.	5
The ability of ground crew to fight a fire while on the ground is minimal. Access to nacelles and the wing/midwing is difficult.	5
White smoke seems to be normal discharge from the engines during start up.	5
The checklist is fine - rotor downwash on the crewchief/plane captain needs to be considered. Positioning of the nacelles/intake covers needs to be examined when operating in snow to minimise the accumulation on the rotors and inside the engine intakes.	5
A lot of smoke coming out of the engine.	5
Need A/C to talk to LSE	5
CO2 bottle has to be place that was the plane captain not being briefed by line chief.	5
During start up there is to much smoke from the number two engine.	5
Excessive downwash	5
With the rotors up high and next to no engine blast, very safe.	6
Again, didn't see any safety problems.	6
Cold weather start up procedures need to be clearly outlied and placed in the check list	6
No issues	6
Except for smoke coming out of # 2 engine during startup.	6
Rather easy, like a skip.	6

S-9-2-4

P-GS03: Rate the overall safety during taxi.

Comment Total Responses 11 (Avg.) 5.0

Extremely poor field of view from aft cabin .	2
poor braking system	5
With APU off, and emergency requiring a rapid dual engine, shutdown, banking is difficult on account of switch selection required.	5

S-9 Results

Utilizing nacelles to control speed is very easy. Strong winds cause a high flapping advisory to post, often that can be corrected by cyclic movement. Braking action, although improved, is still less than desirable, as seen in the aircraft accident with ship 4, anti-lock brakes greatly improve braking action.	5
Use of brakes is suspect per flt clearance.	5
very controllable	5
The aircraft picks up everything in sight and blows it around in every direction. Aircrew need to be very aware of the hazards of FOD while taxiing the aircraft.	5
Brakes don't dissipate enough energy without significant fade and / or not brakes, the accumulator helps.	5
No issues	6
Nacelle control allows another variable to control groundspeed. Operation of the rudder pedals was easy with the power steering engaged. Again, awareness of the downwash proved to be essential, particularly when taxiing around light aircraft - reduction of Nr helped to minimise the effects.	6
no issues	6

S-9-2-5

P-GS04: Rate the overall safety during shutdown.

Comment Total Responses 11 (Avg.) 5.5

B-1 stand a hassle, personnel to high off deck under turbulent winds conducting engine wash. Need to install deck connection ASAP to conduct washes.	4
I noticed no more unsafe.	5
The crechief has to use extreme caution when shutting the A/C down because the rotor wash is very strong and can cause a loss of footing. Also the crewchiefs have to be careful not to lose control of their long cords, rotorwash will pick them up and blow them into the rotors.	5
Did not see any real problems.	5
Probably the draw down I every time they shut down the acft. Both engine cells need to over the deck for wash down.	5
No issues	6
A relatively uncomplex shut down procedure - no problems with blade sail noted and the rotor brake appears to be operating as published.	6
Didn't see any safety problems.	6
Having the prop rotor blades 20 ft. in the air makes it very safe.	6
no issues	6
Safest thing you can do to an aircraft.	6

S-9-2-6

P-GS05: Rate the overall safety during pre-mission operations (Cargo, Pax Loading, AIE Rigging, ETC..)

Comment Total Responses 50 (Avg.) 4.7

Not enough room for gear! Different seatbelts! Like the five point seatbelt.	2
In addition to excessive rotorwash, the troop compartment is too small for 24 combat loaded Marines to board and deplane quickly. With gear, simple tasks such as being able to use or find seatbelts are nearly impossible.	2

Areas considered: Passenger loading

S-9 Results

Marines had trouble putting on the seatbelts with full combat gear, as well as leaving the bird. Marines were getting snagged on the seat belts. 2

Areas considered: other hazard(s) - please comment

the safety belt are inaccessible due to all the gear Marines Wear secondly, there is no room for packs for movement. The seats with gear make the fitting to tight. 2

Areas considered: cargo loading
inadequate ability to safely secure/inspect cargo
Passenger loading

There is inadequate space in the Osprey for marines with a combat load. It takes too long to load and unload. If in a situation where speed is essential, it could be catastrophic. 3

Very small inside, absolutely no room for gear or to move. As a SQD Ldr, I may have to get to the Lt to get an update on our situation which I am unable to do on this bird. 3

Areas considered: other hazard(s) - please comment
Passenger loading

It was very difficult to load Marines with full packs into the aircraft. The main difficulty was the seat/restraint system, and small area to place packs (is not under seats). 4

Areas considered: Passenger loading

The 24 marines with packs took too long to load if you consider executing the loading procedure in a combat zone. 4

Due to the narrow width, packs had to be piled high in the center aisle. 4

Extremely tight, if the aircraft went down egress would be difficult at best. Takes too long to load and unload personnel with heavy packs. 4

Areas considered: Passenger loading

the plane needs to be wide and needs to have work done on seatbelt. 4

Areas considered: inadequate ability to safely install/inspect special mission equipment (I.e. AIE rigging)

Loading slow and crowded. Seat belts too short. 4

Areas considered: Passenger loading

seats to close together when you have a full combat load not enough space to sit or put packs 4

no room for packs tight fit 5

Areas considered: cargo loading
Passenger loading

Problems with loading were not so pronounced as we did not have packs. 5

Areas considered: cargo loading
Passenger loading

With a narrow body, it is hard to ove around inside. 5

Areas considered: excessive trip/pinch/snag/headstrike hazards
inadequate ability to safely install/inspect special mission equipment (I.e. AIE rigging)
inadequate ability to safely secure/inspect cargo

The ramp didn't seem to come completely to the ground. We were carrying heavy loads and had trouble getting on the V-22. 5

Areas considered: excessive trip/pinch/snag/headstrike hazards
Passenger loading

Smaller, tighter space than in other helos. Might cause safety problems. 5

Areas considered: cargo loading
inadequate ability to safely load/unload cargo
Passenger loading

Loading took an extremely long time. I hope it was because we were unfamiliar with the aircraft and safety considerations. With practice, it can improve greatly. There was minimal noise. 5

Width of the cabin is extremely tight, especially with gear. 5

Back hatch and ramp quite high from ground. Quite possibly ineffective or some difficulty in boding some gear. 5

Excessive downwash, cargo rails deform under heavy loads. 5

S-9 Results

Seatbelts.	5
Areas considered: other hazard(s) - please comment	
Much safer tactical onloading with less gear.	5
The V-22 didn't present any safety problems to us while we were on the ground.	5
Cabin are is very small and does not allow for safe passenger loading and unloading. There is no room for their packs and wepons because they can't put them under their seats. That creates a trip hazard in the cabin that is already a very tightly packed area. Loading and unloading cargo is very difficult because of the install of the rail system, total junk! It's hard and time cosuming to install, it's poorly made and breaks on a regular basis. It's also very difficult to put away and stow, system is not user friendly.	5
Difficult to get in the back because ramp does not come down all the way.	5
The rear hatch on this helicopter has not in two flights dropped closer than two feet to the deck. This is unacceptable when considering a fatigued Marine with 60 - 90 lbs combat load.	5
Loading this A/C is difficult - need unit practice. 24 Marines w/ a medium load with virtually 'cube out' the A/C. Because nothing can be stored under the seats everything goes in the aisles. This makes movement in the A/C's narrower cabin much more difficult. It also increases the sense of "closeness" in the back.	5
Areas considered: cargo loading inadequate ability to safely load/unload cargo Passenger loading	
We were able to load faster because it was the second time we have ridden in the MV-22. Also, we did not have packs. I felt the powerful rotor wash moreso this time because we were not weighted down.	5
I think the V-22 should be able to land in both helo and plane mode.	5
The ramp at the rear of the aircraft is extremely high, slowing down on load. The ramp was at or above knee level making running onboard impossible.	5
Areas considered: Passenger loading	
We were given cranials before loading the bird. It took too long to load the bird with all of our gear.	5
The crew came off the V-22 and gave us a pre-flight brief on the operation of exit hatches. The crew was unable to move to the rear of the V-22 without going outside and into the rear, due to the gear we brought on (packs) stacked in the center of the aircraft.	5
Areas considered: inadequate ability to safely secure/inspect cargo Passenger loading	
Difficult to load passengers. Very cramped crew chief cannot load troops because he cannot do so.	5
The ramp should touch the deck for loading/unloading. There was snow on the deck and the three food drop caused marines with heavy gear to fall.	5
Areas considered: Passenger loading	
Loading of packs with gear took a long time. Securing of the packs if over water would have been impossible. Need to find some way to stack packs in the rear or the aisle.	5
It is difficult to strap into the seatbelts partially due to the closeness of the seats.	5
Areas considered: Passenger loading	
The jet wash or rotor wash is more extreme than other aircraft and the stick leader has trouble with balance and counting people on and off the aircraft.	5
Areas considered: other hazard(s) - please comment Passenger loading	
Without packs, there is more room on board.	5
Areas considered: inadequate ability to safely load/unload cargo Passenger loading	
Seatbelts hard to use with gear on.	5
Areas considered: Passenger loading	
Aircraft too small, combat load would not fit.	6
The width of the cargo area is very narrow, therefore, making loading of personnel very difficult.	6
Areas considered: Passenger loading	

S-9 Results

The exhaust made it very difficult to enter the rear of the aircraft with full combat load. It took an extremely long time to load. 6

Areas considered: excessive environmental hazard to ground personnel (I.e. exhaust)
Passenger loading

More room is needed for equipment and passengers. 6

Areas considered: Passenger loading

the 25 man sticks are entirely to large, especially with their gear. 6

Areas considered: cargo loading
Passenger loading

Passenger loading was still very slow and finding the seat belt was nearly impossible. 6

Areas considered: inadequate ability to safely load/unload cargo
Passenger loading

It seems to take a long time to load. It may be due to the marines not being familiar with how the seatbelt system works. Instead of the typical lap restraint, now the system has a shoulder restraint, which can be difficult to manipulate. 6

Areas considered: Passenger loading

Very descriptive from crew. Took time without any obstruction. 6

Not enough room for combat load 6

Male end of seatbelt too short

Should be just waist strap instead of shoulder

S-9-2-7

P-GS06: Rate the overall safety during unpowered ground handling.

Comment Total Responses 8 (Avg.) 4.0

A/C 1 you have to pump up the brake pallet, which is only installed on the boat. On A/C 2 and 3 you have to set and pull the circuit breaker before and after towing. 2

A/C needs manual brake accumulator. Brake mod inadequate for daily use. A/C brakes ineffective without battery power. 3

For A/C 01 you have to pump up the brake pallet, which is installed only on the boat, before you have any brakes. On A/C 02 and 03 you have to pull the circuit breaker before and after use or it will drain the battery. 3

The only problem with ground handling is the danger of hitting blades on the deck, when towing in airplane mode. 4

Any head maintenance in Helicopter mode is a hazard. WIA 56 and 57 are a hazard to access in airplane mode. The APU exhaust is a FOD hazard all the time with the exhaust duct a straight down dark hole. 4

While performing maintenance on the ground, safety is paramount and exercised day in and out 5

A lot of rotor wash, high temp on the bottom of the nacell. 5

It's safe as far as towing manual stow ect.... But the brake pallet on A/C 01 is only installed on the boat. On 02 and 03 you have to set and pull the circuit breakers or you will drain the battery. 6

S-9-3

MXS01: Rate the overall safety of this maintenance task.

Comment Total Responses 292 (Avg.) 4.4

IF VERTICAL, YOU ARE VERY HIGH 2

refer to question #2 2

I had to lay on the blade, and a harness attaching point was not accessible 2

Areas considered: Clearance of work area

No B-1 stand, had to stand on intake 2

WITH NO PROCEDURES IN IETMS TASK CAN BE HAZARDOUS FOR INEXPERIENCE PERSONNEL 2

S-9 Results

Had to stand on intake	2
We had to straddle the blade to access the lower blade fairing and spinner panel screws. Couldn't use harnesses due to the short length of the lanyards, and lack of NORCO fittings on the Nacelle.	2
Had to stand on the lip of the intake to access this shear pin, because stand would not reach, not a very safe thing to be doing onboard a rocking ship	2
Areas considered: Step area Clearance of work area	
Standing on the intake lip felt very unsafe while onboard a ship that is rocking	2
In flight ready position both hands required for deservicing. Height of L/R nacelle access is a factor, bleeding from inside the cabin would be a lot easier.	2
In airplane mode the B-2 platform is too cramped for two people and tools to complete the job, side rails had to be taken down for more room, then the risk of falling is greater. Safety harness is not long enough to straddle the hub and use,so the risk of falling is always present, affecting the quality of the work being done.	2
Areas considered: Clearance of work area	
I had to lay on the blade, and a harness attaching point was not available	2
Areas considered: Clearance of work area	
DAMAGE CAN EASILY OCCUR DUE TO IMPROPER OR NO PROCEDURES	2
Especially in helo mode	2
IN ORDER TO FIND A LEAK YOU HAVE TO HAVE PRESSURE AND AT 5000 PSI THAT IS NOT SAFE	2
"Sucks" on the wing area. More non-skid is needed. See comments in question #7.	2
Areas considered: Non-skid	
Having to stand on the intake lip while ship is rocking isn't very safe, and wearing a harness won't remedy this either, there is no place to hook it to	2
In flight ready position both hands are required for deservicing of hydraulic module. Height of nacelle access is a factor. PPE definitely required. Bleeding from cabin would greatly improve safety, and efficiency.	2
It was hard to reach the area, and leaning over the side of a JLG lift is pretty risky	2
Areas considered: Step area Clearance of work area	
Highest point on the aircraft. No place to stand, hold onto, difficult to access and get to.	2
The 6" hole on the side of the A/C is not enough space, even for a small person to work in.	2
THIS TASK IS NOT SAFE ON THE BOAT. THE BOAT ROLLING, HIGH WINDS, AND MOVING GEAR AROUND A TURNING AIRCRAFT AT NIGHT IN TIGHT AREAS DOES NOT LEND ITSELF TO BEING SAFE. WHEN THE SHIPROLLS THE NACELLES GO DOWN AND THE B-1 STAND GOES UP.	2
Areas considered: Clearance of work area	
IETMs does not tell you to inflate the tires after installing them, so the aircraft could be lowered back down on the deck with only 25 psi in the tires causing damage to the tire or rim.	2
places hands to reach high off ground	2
had to either lay on nacelle or stand on a tool box on the nacelle platform	2
If in helo mode, had to sit on hub to access the area requiring work, which felt unsafe.	2
Areas considered: Step area	
Pulling the head off in this position requires a lot of pulling using full body weight. We only had stands that did not seem big enough to get people on them. Falling was a big hazard or the head popping off and knocking you off was a hazard.	2
Strong winds made the tall stand unstable	3
MOVING STANDS AND CORROSION CONTROL CART AROUND AIRCRAFT WHILE IT TURNING IS UNSAFE, ESPECIALLY ON THE BOAT.	3
Taking off the forward midwing panel 5LT2 is a little unsafe, it is hard to unscrew the left side	3

S-9 Results

MINIMAL AREA ON NACELLE PLATFORM FOR MAINTENANCE	3
Areas considered: Clearance of work area	
Access is too limited to allow sufficient safety.	3
NEED TO POSITION A/C AS CLOSE TO THE SHIP'S ISLAND TO REDUCE HIGH WINDS. SAFETY HARNESS IS A MUST HIGH WINDS.	3
The head did not come off as easily as expected and a stand was needed in front of the head. If the head had suddenly come loose personnel could have been knocked off the stand.	3
Winds were strong and most of the A/C was out over the water.	3
WHILE THE MAGAZINES ARE OUT AND THE PLATES WERE NOT INSTALLED CONNECTORS ARE OPEN TO THE OUTSIDE ELEMENTS	3
THERE IS A POSSIBILITY FOR DISCHARGE	3
NEEDS TWO PEOPLE TO LIFT OVER YOUR HEAD AND MANEUVER BETWEEN CLAMPS	3
cannot install when aircraft is in spots 2,4,8,9 on the boat	3
ON AND LHA IT'S A VERY DANGEROUS ENVIRONMENT	3
Don't feel safe on stands.	3
with out stands using a ladder would be hard to perform.	3
when the globe gets broke, which if is in a prime spot to happen. The broken glass can cut somebody	3
WHILE MAGAZINES ARE OUT AND THE COVERS PLATES ARE NOT INSTALLED, THE CONNECTORS ARE OPEN TO THE ELEMENTS	3
The safety of this task would be completely unacceptable in windy conditions, extreme cold weather	3
The fact that the A/C was over water and the seas were a little rough made safety a factor.	3
If you do not be careful stands can cause damage. People could be pushed around by the rotor head after removal.	3
ladder had to be used on top of a stand was kind of unstable to reach the harness	3
The stands do not reach all spots that need access, had to stand on intake to access some areas	4
Rubber boots should never be worn on a wet aircraft	4
Need new stands for us short guys when working in helicopter mode.	4
YOU ARE UNDER THE AIRCRAFT	4
Extremely acceptable in horizontal mode. Barely acceptable in vertical mode because it takes two hands to hold bucket and push deservicing valve. Dangerous while standing on ladder.	4
Extremely acceptable in horizontal mode. Barely acceptable in helo mode, because it takes two hands to hold bucket and push deservicing valve, dangerous from a ladder.	4
THEIR WAS A NEED FOR A MAINTENANCE CRANE BUT ONE WAS NOT MADE AVAILABLE	4
As long as shops alternate to do the work, the flow of maintenance is fine. If they try to work at the same time, it's a cluster.	4
Was very dark	4
boat was rocking a lot	4
hard to put on spinner dome in helicopter mode . Had to move the stand many times	4
explosive	4
battery heavy to hold up and put into place. Wires get in the way and make it difficult	4
hazmat used on this particular task are very dangerous	4
while working on the b-1 stand the front gate had to be removed to gain access to the bottom fasteners on the panel	4
very easy to work around no safety threats	4
to much maneuvering is required in order to get in the right position to perform maintenance proficiently	4

S-9 Results

early in the morning to gain access to the wing the fuel that spilled on the right sponson was slick even with the non-skid and we didn't have sufficient rags to dry it up	4
THE GEN HEAVY WEIGHT COMBINED WITH THE TIGHT WORKSPACE AND SEVERAL PERSONNEL IN A SMALL AREA PRESENT A CHALLENGE TO AVOID HAZARDS	4
Areas considered: Step area Clearance of work area	
Very dark in the fuel cell, so constantly had to take off my goggles to see what I was doing. That made it unsafe due to the fact that the fuel cell was dripping fuel.	4
THERE NEEDS TO BE A HIGH WINDS LIMIT SET FOR THE AIRCRAFT FOR WORKING ON TOP OF THE AIRCRAFT IT MAY HELP IF AIRCRAFT CAN BE POSITIONED CLOSE TO THE ISLAND TO PERFORM THIS MAINTENANCE SO THAT THE ISLAND COULD BLOCK THE WIND	4
Stand needs repair, very old	4
LACK OF NONSKID ON WING	4
Areas considered: Non-skid	
Ship deck was rolling, high winds, and was unable to take acft. Down to the hanger. We were located in the aft slash, forward of spot 9, which is VERY close to the edge of the ship. Not a very safe environment	4
Areas considered: Clearance of work area	
windy conditons required a buddy system	4
Stand needs repair, very old	4
YOU CAN DIE IF YOU'RE NOT CAREFUL	4
A/C too close to the edge of the boat to use regular wok stand, had to use a forklift with a cage mounted on the forks in order to reach the area needing work.	4
Areas considered: Clearance of work area	
just didn't like situation slippery emperage with bfws	4
Areas considered: Non-skid	
Personnel gets saturated with fuel even with protective gear.	4
very windy, extremely cold bad location of harness hook-ups	4
NEED TWO PEOPLE TO LIFT AND MANUEVER THE BATTERY	4
HIGH VOLTAGE	4
Cannon plug could be easier to remove and install, and the B-1 stand has to be moved to many times.	4
Areas considered: Clearance of work area	
Very tight work area, very easy to cut arms in the process.	4
Areas considered: Clearance of work area	
L.P. AIR CHARGE VALVE ON BOTTOM REQUIRES ONE TO POSITION SELF IN FRONT OF COMPRESSED AIR FROM STRUT/CHARGE VALVE	4
Access is very limited to allow safety.	4
LOW PRESSURE VALVE ON BOTTOM OF STRUT REQUIRES ONE TO POSITION SELF IN SPOSSIBLE DANGER AREA	4
Access is too limited to allow sufficient safety.	4
NEED TWO PEOPLE TO LIFT OVER YOUR HEAD AND MANEUVER BETWEEN CLAMPS	4
the harness I used fit to loose	4
Pulled Panel in Maintenance position. Must over reach on stand to reach the trailing edge and must usually stand on rails of B-1 to reach top of leading edge fasteners.	4
high winds and the constant rocking of the ship, call for extra safety issues such as chains and chawks	4
when stowed excessive oil leak crates slip hazards	4
the mv-22 while in bfws leaks a lot of oil onto a/c creating a dangerous slip hazard on the a/c if the maintenance has to be done	4

S-9 Results

Had the acft in aft slash, right at the edge of the flight deck. Didn't have proper support equipment. Couldn't tilt nacelles down for easier access, so access to them was at helo mode, in high winds and deck roll	4
Up on wing, by nacelle. Tight area to work in.	4
We should not use rubber boots because of risk of slipping on top of A/C	4
Flight ready position is dangerous, due to height, care should be taken.	4
when performing this task on the aircraft, dropping tools or hardware presents a problem	4
YOUR FACE IS DIRECTLY IN FRONT OF L.P. SCHRADER VALVE WHEN CHARGING	4
Don't trust the b2 stand. It would be much more convenient to perform task in a/p mode	4
SPINNER DOMES VERY HEAVY AND TASK IS PERFORMED HIGH OFF THE DECK	4
B-1 MAINT. STAND USED PPE REQUIRED	4
used b-7 stand	4
everyday iis a risk so maybe I shouldn't put un acceptable ? Writing cramps from writing these	4
The area where maintenance is performed is very hard to get to in helo mode. Dropping tools and hardware at this height could pose problems to equipment and personnel on the deck.	4
Areas considered: Clearance of work area	
There aren't enough safety harness connections to work on this particular task	4
IF WHEEL ASSY BLOWS WHILE SERVICING, A LOT OF COMPONENTS WOULD BE DAMAGED IN THE NLG AREA.	4
the wia was removed and reinstalled twice while in flight ready pos. It would have been easier in maintenance mode	4
Task was relatively safe to accomplish	4
Don't trust the b2 stand. It would be easier to perform the task in a/p mode	4
Some of the areas were not reachable from the stand, and no harness attaching point were accessible	4
L.P. AIR CHARGE VALVE ON BOTTOM REQUIRES ONE TO POSITION SELF IN FRONT OF COMPRESSED AIR FROM STRUT/CHARGE VALVE	4
DAMAGE CAN OCCUR IF TIRE BLOWS. TIRE PSI IS TOO HIGH NEW DESIGNED TIRE IS NEEDED WITH LESS PSI.	4
CLEARANCE OF AREA DOES NOT ALLOW FOR A SAFE WORK ENVIRONMENT	4
HAD TO STAND ON WINDOW	4
Had to stand on railings a few time to access the area requiring work	4
Areas considered: Clearance of work area	
being on an aircraft on top	4
DAMAGE CAN OCCUR IF TIRE BLOWS PSI IS TOO HIGH, BETTER TIRE DESIGNED IS NEEDED WITH LESS PSI	4
DAMAGE TO COMPARTMENT COULD OCCUR IF TIRE BLOWS.	4
Floorboards need to be installed when not working in area	4
Tight places, akward positions with bulky objects. High off the ground.	4
no safety bk at all	4
LOW PRESSURE VALVE ON BOTTOM OF STRUT REQUIRES ONE TO POSITION SELF IN SPOSSIBLE DANGER AREA	4
Possible fodding of L/R nacelle if repairing in flight ready position.	4
need better stands for ships	4
LACK OF NONSKID ON WING	4
Areas considered: Non-skid	
with aircraft in flight ready extreme caution should be used due to height.	4
This task can be very dangerous procedure if people are not briefed and communication is poor.	4

S-9 Results

the sealant used 8802 is very toxic and cannot be inhaled as it a hazrdous substance	4
SMALL AREA TO WORK IN	5
I HIT MY HEAD ON THE ROTOR HEAD WHILE IT (THE ROTOR HEAD) WAS ON THE WORK STAND	5
PILOTS SEAT IN WAY HAVE TO SIT ON KNEES IN PILOTS SEAT	5
Areas considered: Clearance of work area	
THE NEW NON-SKID WORKS BETTER THAN THE OLD STUFF, EVEN WHEN A/C WAS WENT	5
On nacelle	5
I had to laen over the side of the stand excessively. On the ship or in high wind conditions this would be quite risky	5
every shop should be issued a flashlight with a red lense	5
Safety could have been improved with if there was better to support equipment.	5
need more lanyard hook-ups	5
68 POUND BATTERY. THE BATTERY IS LIFTED ABOVE THE AVERAGE MAINTAINERS HEAD. CREATING A RISK OF INJURYTO PERSONNEL OR EQUIPMENT	5
nothing on nacelle is extremely safe	5
wind could definitely blow you off theship if you weren't paying attention	5
HEIGHT YOU HAVE TO REACHTO TO REMOVE OR INSTALLIT IS OVER YOUR HEAD	5
engine was clear	5
Areas considered: Clearance of work area	
AIRCRAFT ON JACKS	5
on ship	5
could access w/o removing spin dome&panels but very akward positioning to see, did remove panel because components were visilbe and did not want to risk the chance of losing panel parts	5
this task has been performed a lot more than it should be	5
WEAKER PEOPLE COULD BE NJURED DOING THIS IF NOT CAREFUL OR ASSISTED	5
NOT MUCH CLEARANCE BETWEEN BOTTOM OF THE PLANE AND THE DECK	5
Slight slip hazard on aft wing, near the conversion actuator panels.	5
"BOAT" WHAT ELSE DO I HAVE TO SAY	5
as to be expected with this system	5
no risk unless a/c power was on	5
Had to reach over the cherry picker bucket to reach click studs.	5
no risk unless a/c power is on	5
I HIT MY HEAD ON THE ROTOR HEAD WHILE IT (THE ROTOR HEAD) WAS ON THE WORK STAND	5
In flight ready position, deservicing at that high a level both hands are required to accomplish the task.	5
ON WORKSTAND	5
FELT UNSAFE ON THE LITTLE GAIN T LADDER	5
ON WORKSTAND	5
Safety observer needed for ramp/door bleeding operations.	5
Both hands required, inflight ready position, personnel should be extremely careful at such height.	5
On nacelle	5
Had to climb on nacelle to get to the top bolts.	5
Top of nacelle may or can be hazardous due to the lack of non-skid	5

S-9 Results

IT COULD BECOME DANGEROUS IF THE SHIP IS ROCKING OR IF IT IS FOUL WEATHER.	5
HAD TO USE WORKSTAND. HAD TO WATCH FINGERS AND HANDS AROUND MOVING PARTS OF FLAPS	5
Had to stretch a little to reach the top bolts.	5
ATTACHING CLICKSTUDS FOR CAMERA MOD REQUIRES SEALANT AND PPE	5
Use PPE, while performing this task care must be taken with using the ladder. Both hands are busy and a bucket is needed to catch overflow. Spilling hydraulic fluid is possible (hazmat issue)	5
WAS ON WORKSTAND	5
was on workstand.	5
OIL USUALLY LEAKS THROUGH AND GETS ON FLOOR, MAKING IT SLIPPERY	5
WAS ON WORKSTAND	5
FLUID LOSS COULD BE SPLASHED INTO EYES SOUNDPROOFING AROUND THIS AREA CAUSES FLUID TO POUR BEHIND IT	5
need to let the area cool down before working on this task	5
HAVE TO BE VERY CAREFUL OF ROTOR WASH AND NACELLE MOVEMENT. COULD BE A VERY BAD SITUATION IF NOT HANDLED WITH THE RIGHT AMOUNT OF CAUTION	5
With aircraft power off, it's safe	5
ON TOP OF THE A/C IS ALWAYS A LITTLE UNSAFE	5
all ways some dangers in shooting for power. Come with the territory	5
Had to stand on workstand to get to location	5
There is a good chance of hitting your head.	5
Care/caution should be taken. Usually takes 2 people, one aft, one fwd to install panel. B-1 stand is small and usually rails need to be removed to fit in location.	5
Areas considered: Clearance of work area	
There is a definite risk of FOD due to the bad design of the mini-mart fasteners on the access panels.	5
Use of sealant is required proper ppe required.	5
Care must be taken on maintenance stands aft, top panel. One person must be on the nacelle to remove and install. Size of dome panel is very cumbersome in relation to positioning onto the airplane and connecting cannon plug.	5
AWKWARD GUIDING THE SWASHPLATE DOWN THE WORK STAND	5
WAS ON WORKSTAND	5
had to move the stands around a lot	5
When floor boards are removed there is limited walk space in the cabin.	5
Areas considered: Step area	
ONLY IN HELO MODE IS HARDER	5
this task is show from graphics in nacelle maint mode but we did this in helo mode. If we had done in airplane mode I felt it would have been unsafe with assy mounted on the top of the nacelle	5
NOT ENOUGH ROOM TO MOVE STANDS AROUND AND OVERHEAD CRAN HAS A SLOW REACTION TIME	5
as expected	5
REQUIRED A B-1 STAND AND PPE	5
could be hazardous on flight deck of a/c line	5
could be a problem in wet conditions for atop t/s that's required	5
VERY LITTLE ROOM TO WORK AROUND THE WING FENCE AND THE NACELLE, SPOTS ON THE PLAN WHERE THE NONSKID IS RUBBING	5
The work platform on the nacelle makes maintenance easier	5

S-9 Results

ON THE BOAT AT NIGHT COULD USE MORE LIGHT	5
I might not be able to have kids because of the test set, with RF energy being transmittes	5
Rotor head removal is a high profile task. Special attention needs to be paid to everyone involved.	5
WAS ON A WORKSTAND	5
Not much clearance.	5
Areas considered: Clearance of work area	
Head hazard.	5
no major risk requirement	5
The hydraulic man lift that were electrically powered were a lot of help and very maneuverable	5
ietms needed to have a step to pull cb's for cv-2 to its removal step to access the env 2 health monitor	5
While snow is on your boots, it isn't smart to climb on top of the aircraft	5
high voltage	5
when an aircraft comes in it could blow washers out of your hand or something else. Something to thinkabout in the future	5
no real risk	5
NON SKID IS RUBBING OFF IN PLACES ON THE PLANES TOP AND SPONSONS	5
Areas considered: Non-skid	
We had to climb all over the nacelle like a jungle gym. With the task performed in airplane mode, I never realy felt safe with it.	5
WORK PERFORMED ON A WORKSTAND	5
WAS ON WORKSTAND	5
VERY HIGH UP OFF THE GROUND	5
ON WING	5
The most unsafe task was installing PRGB in trailer.	5
All lifting operations of heavy objects are dangerous.	5
Getting stands close enough to the proprotor when vertical is the biggest safety concern. The floor in the hangar was slippery and made it very difficult to move stands around while trying to not lose your footing.	5
WAS ON A WORKSTAND	5
the seu weighs over 50 pounds	5
On workstand.	5
HARD TO HELP WATCH A/C WHILE RUNNING CART. SHOULD HAVE SECOND PERSON WATCHING SOMETIMES	5
A VERY BAD HEAD HAZARD WHEN SLIDING UP INTO THE NLG AREA	5
NOT VERY MUCH CLEARANCE AROUND THE AREA THAT WAS BEING WORKED ON	5
WAS ON A WORKSTAND	5
ON WORKSTAND. HAVE TO BE CAREFUL NOT TO CUT YOURSELF ON CLAMPS AND OTHER COTTER PINS DUE TO NOT BEING ABLE TO SEE.	5
B-4 STAND WOULD BE MORE SAFE AND ALLOW FOR BETTER ACCESS	5
In helo mode, you must move B-5 stand to both sides of the nacelle, on a hangar deck of an LHA or LHD, LPD movement of these stands will require space on that side of A/C to move it around. Also check ceiling clearence on hangar deck.	5
Areas considered: Clearance of work area	
On wing of aircraft	5
WAS ON TOP OF A/C	5
only danger encountered was climbing the aircraft	5

S-9 Results

BATTERY WEIGHS 68.3 POUNDS AND HAS TO BE CARRIED OVER AN AVERAGE PERSONS HEAD TO REMOVE OR REPLACE	5
On sponson.	5
A LITTLE ANNOYING WITH 40 KNOT WINDS	5
You are up on sponson.	5
HAD TO PERFORM MAINTENANCE ON FLIGHT DECK WITH WIND BLOWING	5
ON WORKSTAND.	5
Due to the task location, maintenance was forced to work off of the wing.	5
ON WORKSTANDS. HAD TO GET ON TOP NACELLE TO TOP BOLTS IN	5
small work area on top of sponson.	5
AIRCRAFT WAS ON JACKS	5
in wet weather A/C can be slippery	5
risk free	5
NOT A LOT OF CLEARANCE IN WORK AREA, DRILLING IS AN EYE HAZARD	5
If we had the proper sling for the actuator this task would have been a lot safer.	5
AWKWARD TO BRING THE SWASHPLATE DOWN WHEN GUIDING IT DOWN OFF THE STAND	5
A safety note might be advisable for windy conditions, as the dome catches wind easily.	5
NEED SCISSORS LIFTS OR JLG- LIFT ASA STUDIER MORE MANEUVEABLE PLATFORM WHEN DOING ELEVATED MAINTENANCE	5
WAS ON EDGE OF A/C ON TOP WITH CRANIAL	5
HAD TO REACH WHEN I WAS HIGH UP ON A STAND	5
If we had the proper sling for the actuator this task would have been a lot safer.	5
On top of aircraft by rudders	5
On top of aircraft by rudders.	5
Just the normal hazards with troubleshooting, noise and electricity	5
SAFETY MUST BE CONSIDERED WHEN ON TOP OF NACELLES AND WHEN THE RAILS OF THE SE MUST BE REMOVED TO ACCESS FASTENERS.	5
WORK STANDS B-5 STAND ETC	5
Akward position at the 3 o'clock, top or 9 o'clock position	5
need more lanyard connections on a/c	5
ON WORKSTANDS. HAD TO GET ON TOP NACELLE TO TOP BOLTS IN	5
blade folded the head was on the stand made the job very easy with minimal hazards	5
in wet weather A/C can be slippery	5
Highest area of aircraft	5
Had to use workstand.	5
SAFETY MUST BE CONSIDERED WHEN ON TOP OF NACELLES AND WHEN THE RAILS OF THE SE MUST BE REMOVED TO ACCESS FASTENERS.	5
working under aircraft	5
Akward position at the 3 o'clock, top or 9 o'clock position	5
In helo mode, you must move B-5 stand to both sides of the nacelle, on a hangar deck of an LHA or LHD, LPD movement of these stands will require space on that side of A/C to move it around. Also check ceiling clearance on hangar deck.	5

Areas considered: Clearance of work area

S-9 Results

AIRCRAFT WAS ON JACKS	5
AIRCRAFT ON JACKS	5
While sticking your arm in and out, you are constantly getting scratched, gouged and cut by click studs and clamps.	5
A safety note might be advisable for windy conditions, as the dome catches wind easily.	5
No safety hazards present	6
had to stand on cart.	6
Areas considered: Clearance of work area	
^^	6
PPE	6
could not find this ietms	6
b-1 stand work good	6
NOT VERY MUCH CLEARANCE	6
b1 stand worked good	6
On workstand	6
other than getting frost bite everything was good to go	6
on ship	6
Crainial must be worn inside the wheelwell.	6
confined area but easy to access to this area	6
Areas considered: Clearance of work area	
USE WORK STANDS TO ACCESS RIGHT OUTBOARD NACELLE	6
had to stand on cart.	6
Areas considered: Clearance of work area	
very windy but harness worked perfect	6
Only rated this at this level because the head was on the hanger deck, otherwise it would have been pretty difficult	6
PPE	6

S-9-3-2

MXA01: Rate the accessibility to the system/component being maintained for this task.

Comment Total Responses 536 (Avg.) 4.2

Panels sometimes hard to line up fastener holes. You can't see how to line up the holes because the retaining clips that keep the fasteners in the panel severely hamper visibility. Maintenance stand usually has to be moved around 2 or 3 times to access leading and trailing edge fasteners. Also retaining rings also have unique ability to dissappear creating fod hazards.	2
In the field we couldn't do this because of lack of support equipment	2
Areas considered: NBC equipment Cold weather equipment	
The spindle bearing is difficult to access with the borescope.	2
To many screws to many panels.	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
B1 data-bus is routed under the prop-rotor gearbox. Had it been a broken wire, the gearbox would have to be removed in order to repair the wire	2
Areas considered: Clearance around the system to perform maint	

S-9 Results

Way too many panels and fasteners to remove. 2

Areas considered: Number of panels to remove to gain access to the system
 Number/Type of fasteners to remove to gain access to the system
 Clearance around the system to perform maint

INBOARD SWASHPLATE NOT EASY TO GET TO. 2

In order to deservice, access to the left and right nacelle is required. For ease of task and expediency, hyd bleeding from cabin would be extremely acceptable. One person would only be required, as access to view HFLM would be available. 2

WHEN HEAD WAS ON THE FLOOR ACCESSABILITY WAS OK, BUT YOU COULD BARELY SEE WHAT YOU WER DOING. ONCE HEAS WAS ON THE A/C YOU HAD TO SET ON THE BOTTOM BLADE AND TAKE YOUR CRANIAL OFF TO GET IN A POSITION TO SEE WHAT YOU WERE DOING THAT IS WITH THE BLADES FOLDED AND NACELLES IN HORIZONTAL POSITION 2

If in the field, support equipment would not be readily available, and access to the top of the hub would be difficult 2

IETMs says for blades to be folded and nacelles horizontal. We had the plane in helo mode and had no problems but our arms getting tired. 2

There are a lot of fasteners to remove the 2 panels covering the nacelle motor. 2

If in the field, could not do job because of high location on the hub 2

Areas considered: NBC equipment

I SHOULDN'T HAVE HAD TO ACCESS IT BECAUSE IT IS A 6115 JOB, NO A 6155 2

MINIMARK STRIPS TO EASY AND RETAINERS COME OFF ALL THE TIME. THEY ARE A FOD HAZARD 2

This could not be completed if A/C went down in the field, no way to repair wires in airplane mode and extremely hard to do in helo because there is no way to get up on the hub. 2

Areas considered: NBC equipment
 Cold weather equipment

In order to de-service access to L/R nacelle H\hydraulic module required. For ease of task and expediency, cabin bleeding would be extremely acceptable. One person would only be required then. 2

Would have been easier and safer in Maint mode position 2

Task would have been much easier if acft was in maint mode position 2

HAD TO REMOVE SEVERAL WIRE BUNDLES FROM AIRCRAFT TO REMOVE SWASHPLATE ACTUATOR 2

If aircraft was in the field, we would not be able to repair this harness or wires in this area because it would be inaccessible. 2

NEEDS QUICK DISCONNECTS AT SERVICING PORTS 2

Really hard and time consuming to get the access panel off. 2

If aircraft went down in the field, the job would be really be difficult given the location of the pins 2

HAD TO REMOVE SEVERAL COMPONENTS (4) ESPECIALLY THE (HUD) CONTROLLER JUST TO INSTALL 2

Anti-drive assembly has to be disconnected to get access to valve. 2

If acft went down in the field, we would never get to the CDD 2

Areas considered: NBC equipment

there should be easier way to locate and replace this switch 2

Areas considered: Number of panels to remove to gain access to the system

accessibility to the switch is acceptable, but the harness is too short from switch to disconnect 2

To R&R generator is like putting together a puzzle in order to make it fit in the hole and into place. 2

Areas considered: Number of panels to remove to gain access to the system
 Number/Type of fasteners to remove to gain access to the system
 Clearance around the system to perform maint

S-9 Results

ACCESS TO THE ARE WHILE ROTORS ARE TURNING IS DIFFICULT AND OPENING THE PANEL IS EVEN HARDER (SHIP ROLLING AND WINDS) WASH FITTINGS SHOULD BE SOME WHERE LOWER ON THE AIRCRAFT	2
Areas considered: Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint Cold weather equipment	
Space is difficult to get hands into.	2
depends on swashplate position (fwd/aft) weather we have to take off lower panels also have to take off spinner dome to get access	2
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
THE LOOK DOWN WINDOW IS TO SMALL AS AN ACCESS PANEL TOO.	2
DOGBONE IS VERY UNACCESSIBLE	2
While removing and installing the generator, the left hand beam and wire bundle get into the way. About 1-3in more space would decrease the chance of damage to the generator, wire bundle, fairing support beam, midwing gearbox drive shaft, coupling, and wing stow ring.	2
to reconnect the cannon plugs on the wia one would have to be very careful not to bin the pins on the cannon plug but at the same time very evry skilled at maneuvering large things in small tight places	2
Stand would not reach high enough	2
Areas considered: Clearance around the system to perform maint	
There is a 6" X 2" square for me to stick my head and arms to meter the wires. The man who designed this A/C did not realize the maintainer may need to access this area.	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
Had to remove the spinner to access this component. Removing the spinner and screws can be difficult. Each removal usually involves stripped screws. Component tough to access in rotor head.	2
c/p's on the rear or wia 12 awkward to reach	2
cannon plugs on back of wia 12 awkward to reach	2
too many fastners	2
B1 runs under the propotor gearbox, if the wire needed repai, the gearbox would require removal in order to access the wires	2
Areas considered: Clearance around the system to perform maint	
these components are hard to reach and hard to tighten	2
The l/h green blade was at the top of the inverted Y, making it much more difficult to access the leading edge.	2
SEALANT ON HEAD OF BOLTS MAKES TASK DIFFICULT. SEEMS LIKE OVERKILL.	2
MUST HAVE A BETTER WAY TO ACCESS THE PITCH CONTROL RODS. REMOVING THE SPINNER PANELS IS TOO TIME CONSUMING	2
hard to reach all the areas to clean out the dirt	2
see question # 4	2
FASTENERS WAS HARD TP GET INTO HOLES. THE HYDRAULIC LINE DOESN'T LIKE TO LINE UP SO YOU CAN PUT IT ON. WE HAD TO TAKE OFF BOTTOM END OF SWIVEL TO GET HYD LINE TO LINE UP.	2
Far too many fasteners to take out in 1 panel. Three different tools were needed, an apex, and two different sizes of offsets were required. Also, due to the location, the possibility of dropping a tool or fastener down the intake is bad	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
No B-1 stands, so I had to climb up onto nacelle and stand on the intake	2
Areas considered: Clearance around the system to perform maint	
safety wire the inside screws was a bitch. I didn't have experience	2
Had to stand intake	2
NEED B-2 STAND TO REACH BLADE FAIRING OF A/C IN VERTICAL POSITION.	2

S-9 Results

No way to get z solid bite with the socket, the wire bundles are too close to the dogbone top and bottom cotter pins were next to impossible to install	2
The cannon plug on the back of the spinner dome is very difficult to reach as well as attach and takeoff. If the wires were 2 inches longer it would more than likely solve the problem.	2
very hard to reach inside to get all the dirt out	2
Too many panels to take off to gain access to the shear pin, and because of their location above the engine intake, the possibility of dropping F O into the intake is ever present	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
intermittent failure once could not discover what component failed if any	2
Plus the stack up info was not in IETM, had to use blue prints which may not always be available	2
Areas considered: Clearance around the system to perform maint Cold weather equipment	
the cannon plug for indicator should have more slack so the indicator can come out of the panel completely and further not have to be removed panel near pilots peddles. Also once panel is removed access to cannonplug is difficult	2
When the aircraft is in helo mode this job is very hard	2
This task would not be able to be done in the field, because stands that could reach the top of the heads would be required	2
Areas considered: Clearance around the system to perform maint	
Only way to gain access to this area is with a large/tall stand	2
Some areas have little or no access for the use of tools. (ie. Aft PRGB firewall) This task took 3 hours to remove 7 or 8 screws.	2
IT WAS TOO CROWDED	3
the harness part of a control feature that allows the nacelles to be lowered . It was severed and the nacelles would not lower . Therefore gave us the trouble getting to the harnessr	3
AREA AND CONFIGURATION OF BRACKET SOMETIMES MAKES IT DIFFICULT TO BE ABLE TO HOLD ON TO THE HARDWARE OR INSTALLATION HARDWARE WITHOUT DROPPING IT	3
The flight control module is hard to reach with the B-1 stand and the B-2 stand is to tall. In field conditions it would be impossible to do this task without a stand. None of the stands that are tall enough to fit in the back of the V-22.	3
Access is extremely limited.	3
Very hard to get to areas under the CDD when in helo mode, tight confines made it very easy to drop tools and hardware.	3
Areas considered: Clearance around the system to perform maint	
the wire bundles in front of compartor make it difficult to install/ remove cannon plugs, install compartor. Also had to remove hud/nvg controller which is extra work. It is also difficult to install screws	3
panels r613 are hard to get to either removal or install	3
Was very hard to reach	3
Minimark fasteners strip out too easy	3
tough to check power directly from gen #2 w/engine turning	3
The clamp and hardware stack-up is not in IETM's	3
for a crucial component such as this its ridiculous to pull off that many fastners on one panel	3
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
plcu rubs on c/p/s and will eventually causes chaffed wires	3
Areas considered: Number of panels to remove to gain access to the system	
wire bundles do not belong clamped in front of removable components because everytime that part is pulled you rub the wires and will eventually cause wire chaffing and/or breakage of wires	3
some things required for t/s were well spaced to far apart	3
while trying to install wire thru clamps need to move panel just for one clamp cuz it is hard to guide it thru.	3

S-9 Results

WITH THE GIVEN LOCATION OF ENGINE ROTORWASH ATTACHMENT FITTINGS, ACCESS IN ONLY AVAILABLE WITH B-1 STANDS	3
Areas considered: Number of panels to remove to gain access to the system	
TOO MANY WIRE HARNESSSES TO DISCONNECT. 4-6 HOURS REQUIRED TO UNDUE AND REDUE WIRE BUNDLES. ALL AROUND INTERCOSTAL . WIRE SHALL RUN BEHIND ACTUATOR NOT IN FRONT. INTERCOSTAL SHOULD HAVE SCREW WITH BOLT HEAD. NEED 3 ATTACHMENT POINTS FOR SAFETY HARNESS ES	3
SCREWS SEEMED TO STRIP EASILY	3
LOWER GIMBEL EXPANSION PIN IS BARELY ACCESSABLE. THE WING HAS TO BE STOWED TO GET TO IT	3
Areas are hard to reach, and the bolts behind the CDD are very difficult to reach	3
The flight control module is hard to reach with the B-1 stand and the B-2 stand is to tall. In field conditions it would be impossible to do this task without a stand. None of the stands that are tall enough to fit in the back of the V-22.	3
IF THE LOWER NACELLE PANELS HAD LATCHES INSTEAD OF SCREWS LIKE THE NACELLE DOORS DO THIS TASK WOULD BE CUT IN HALF.	3
THE SPACE WHERE THE WORK IS DONE IS TOO CROWDED	3
hidden by other componets. Could not fit tq wrench to get proper tq.	3
having to remove the spinner makes this task more than twice as long to complete	3
Areas considered: Number of panels to remove to gain access to the system	
SPINNER PANEL FASTENERS CAN BE DIFFICULT TO ACCESS	3
strip because their screws should be a bolt	3
Areas considered: Number/Type of fastners to remove to gain access to the system	
had harnesses had to reach inside head itself	3
The APU Fuel feed line should be clamped more. The line receives a lot of vibration and will probably continue to come loose over time	3
hard to look inside the intake or get one hand in there to work because the area is to small	3
wia 9 is behind abiu- difficult to read t3 pins	3
Hard to get to the link to torque it.	3
HARD TO GET TO THE STOWRING AND NEXT TO IMPOSSIBLE TO SEE THE WINGLOCK PINS	3
FLOORBOARDS ARE HARD TO PULL OUT AND NEED TO BE IN 2 PIECES	3
KIT-1C mount was in the way of the back screws, and had to be unmounted to gain access.	3
Areas considered: Clearance around the system to perform maint NBC equipment Cold weather equipment	
The plane was in airplane mode, which made reaching the lower/back side of the swashplates difficult to access	3
Areas considered: Clearance around the system to perform maint	
#4 hanger bearing grease fittings are very hard to reach with a grease gun	3
ACCESS IS DIFFICULT. LIMITED AREA DUE TO I/R SUPPRESSOR DUCT	3
The mag plugs and oil filter cannot be inspected on a daily. Multiple panels must be pulled to access the area. They should have quick acess pannels for daily's	3
It is very difficult to inspect the inner diameter of the stowring because there are only small access points which do not allow full access to the stow ring.	3
SPINNER PANEL FASTENERS CAN BE DIFFICULT TO ACCESS	3
FLOORBOARDS ARE A PAIN TO GET OUT	3
Camera mod was in the way.	3
HAVE TO REMOVE ALMOST ALL FORWARD NACELLE PANELS TO GET TO BOLTS IN AIRPLANE MODE	3
PANEL NOT EASY TO WORK AROUND	3

S-9 Results

HAD TO USE PLIERS AND FLASHLIGHT AT THE SAME TIME. COTTER PINNING IT WAS VERY HARD AND PAINFUL	3
THE SCREWS ARE VERY EASILY STRIPPED	3
fairly easy to get access to for nut somewhat difficult to align to cotter key	4
Z BRACKET IS HARD TO GET TO. IT IS A SMALL SPACE	4
Helo mode only a B-1 works	4
IF SERVICING BOTTOM LOW PRESSURE SCHRADER VALVE, YOUR FACE IS IN FRONT OF AIR VALVE	4
Had to use a borescope.	4
NOT FUN TO DO, THERE SHOUD BE AN EASIER WAY	4
WIRE HARNESS INTERFER WITH R & R	4
best to work this in maintenance mode	4
HARD TO REMOVE THE COTTER PIN FROM THE SUPPORT ASSEMBLY BOLT AND THE INBOARD LINK NUT ALSO HARD TO TORQUE THEM.	4
In flight ready position, the b-2 stand must be used. If two blades are to be accessed stand must be repositioned.	4
The blade fairings was in flight ready position, it was difficult to access. Large maintenance stand required stand is cumbersome and difficult to position by one maintainer. If two or more blades were needed to be accessed it would be frustrating to keep moving the stand.	4
To deservice one must be inside the nacelle at the module for systems 1 and 2. Access to the reservoir bleed is on the module. Access in cabin area would greatly reduce time of deservicing procedure. Also improving saftey of task, in addition would allow for ease to check level of HFLM by one maintaince personnel instead of two.	4
The antenna is at a hard to reach area of the rear sponson. For it to be CDI'd the inspector had to clinmb into the sponson with a flashlight.	4
PANELS SHOULD HAVE EASIER ACCESS LATCHES AND NOT MINIMARK FASTENERS. ATTACHMENT FITTINGS ARE TOO HIGH. IT MAY REQUIRE THE USE OF B-1 STAND.	4
This aircraft was not designed for maintenance. The panel fasteners have to go, the inlet panels need improvement as far as installing.	4
The access to work in fuel cell is too small making it very hard to work with two hands.	4
Areas considered: Clearance around the system to perform maint	
HAD TO REACH INTO A SMALL TIGHT SPOT ON THE A/C.	4
Removal of panel 6R13 requires a special shaved down, extra long allenwrench (with a long string attached) to remove the mini mark 4 fasteners.	4
Areas considered: Clearance around the system to perform maint	
used ietms and nalcomis station	4
YOU MUST HAVE A B-1 STAND OR THE TASK CANNOT BE PERFORMED	4
A/C WAS IN BFWS. IT WAS HARD TO GET STAND UNDER NACELLE BECAUSE OF FUEL PROBE	4
NOT A LOT OF CLEARANCE AROUND OR IN THE NACELLE	4
NOT A LOT OF ROOM AROUND NACELLE TO INSTALL BAFFLE	4
Safety wiring outside bolts was difficult	4
Areas considered: Clearance around the system to perform maint	
Slipring is always unsatisfactory to access nacelle connectors. They are mounted at different length all over the nacell clamped in terrible areas. Why couldn't these have been equal length plugs in one central easy access point?	4
WITH BOLT BENT ITS KINDA HARD TO GET OUT	4
Nacelle area extremely crowded.	4
Areas considered: Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	

S-9 Results

THE FLOOR OF THE HANGAR IS VERY COLD NOT VERY MUCH CLEARANCE AROUND THE NLG AREA YOU HAVE TO LAY DOWN ON THE DECK AND SLIDE UP INTO THE NLG COMPARTMENT 4

Areas considered: Clearance around the system to perform maint
Cold weather equipment

Not very much clearance. 4

Areas considered: Clearance around the system to perform maint

A/C WAS IN BFWS. IT WAS HARD TO GET STAND UNDER NACELLE BECAUSE OF FUEL PROBE 4

Helo mode only a B-1 works 4

as stated in question #3 4

IT IS VERY HARD TO REMOVE AND INSTALL MINI MART FASTENERS ON PANEL 6LI3 BECAUSE OF THE CLEARANCE BETWEEN THE PANEL AND THE CONVERSION ACTUATOR. YOU HAVE TO REMOVE TO MANY CLAMP HOLDING WIRES BUNDLES TO GAIN ACCESS THEIR NEEDS TO BE MORE PLACES TO ATTACH SAFETY HARNESSSES IN THE WING TIP AND NACELLE AREA 4

Areas considered: Number/Type of fastners to remove to gain access to the system

HAD TO REMOVE SOUNDPROOFING TO GET TO PORT 4

Had to use a borescope. 4

THESE Z BRACKETS ARE A MAINTAINERS NIGHTMARE. THEY ALSO FORCE OUR WIRE HARNESS TOO CLOSE TO THE DOG BONE, ALSO ARE VERY HARD TO SAFETY WIRE IN THAT CLOSE PROXIMITY 4

SOME MINI MARKS WERE HARD TO GET TO 4

HAD TO REMOVE SOUNDPROOFING TO GET TO PORT 4

Large maintainance stand was difficult to position. 4

in opposite avi panels 4

Because of the system, BFWS (S/S/S 6600) was in helo mode, (flight not ready mode) we could not bring the nacelles down to use to maintain them. Getting up to the heads proved rather difficult, and an odd assortment of equipment had to be used to do so. 4

Areas considered: Number of panels to remove to gain access to the system
Number/Type of fastners to remove to gain access to the system
Clearance around the system to perform maint

The clearence for the generator is pretty tight. You do have room but if the ship shifted or moved due to rolling seas other components could be damaged. Due to the contact of the generator. 4

Areas considered: Clearance around the system to perform maint

Not very much clearance around area. 4

Areas considered: Clearance around the system to perform maint

Access is very time consuming. 4

Areas considered: Number of panels to remove to gain access to the system
Number/Type of fastners to remove to gain access to the system

Captive fasteners are very easy to break and lose. Areas to different sections of engine are sometimes very difficult to access. 4

Captive fasteners are easily broken. 4

The captive fasteners are easy to brake. 4

THE CANNON PLUG IS IN A VERY TIGHT SPACE. ONE CAN JUST FIT INTO TAKE OFF THE SCREWS THAT HOLDS IT HERE 4

the plane being folded also helped make the installation of the click studs and the line that it was connected to much easier. 4

SOME OF THE SCREWS THAT HOLD THE WINDOW IN STRIPPED OUT WAY TO EASY 4

when we first went to work, we did not have a stand available 4

HANGAR WAS COLD 4

Due to the conductive sealant on the antenna it took too long to take it out. The only way to take it off was to pry it off which could possibly cause damage to the copper mesh. 4

S-9 Results

IT'S A TIGHT FIX IN BETWEEN THE WING AND NACELLE	4
NO ROOM IN THAT AREA TO WORK IN. HAVE TO REMOVE ONE PANEL TO GET TO THIS PANEL	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
Very little clearance around the area that is being worked on.	4
It's a pain to remove the two panels to get to it.	4
Space was difficult to work in	4
Had to remove wire clamps to gain space to install baffle	4
Not enough clearance between the firewall and the cannon plugs	4
Areas considered: Clearance around the system to perform maint	
A/C is very hard to get clean. Different wash equipment and procedures might need to be used.	4
Constantly moving maintenance stands to gain access to fasteners securing fairings.	4
To deservice one must be inside nacelle panel at reservoir/module. This makes it more difficult to access and more time consuming.	4
Have to keep moving maintenance stands around to gain access to blade fairings.	4
Maintenance stand has to be moved at least twice to install our panel. This is due to location of fasteners securing panel.	4
PANEL RIGHT BEHIND COUNTER BALANCE. YOU HAVE TO PUSH BALANCER OVER TO GET TO IT AND OFF & ON	4
THE CLAMPS PREVENT EASILY REMOVALAND INSTALLATION	4
no panels , no loose hardware, nothing to bag and tag. I like this job	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
Captive screws are very easy to break and lose. Access to different parts of the engine are sometimes difficult.	4
see question #2	4
The plane being folded makes the replacement of this line easier. It lets you reach both sides of the tube. There is also a click stud that gets in the way of removing this tube.	4
difficult to safety wire	4
could use more room for your hands for the c/p's on the bottom firewall	4
It took the cherry picker a long time to stup andget us in the right areasfto work, and we couldn't get close enough to the aircraft.	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
MLG trunnion attach points difficult to access: Tight working space inside MLG areas.	4
We had to remove the intake to take an oil sample in helo mode. There should be an access panel to get to the drains on the PRGB.	4
No Stands were tall enough to reach red blade while in maintenance position.	4
YOU HAVE TO REMOVE THE INTERCOSTAL TO REMOVE THE ACTUATOR, THE HIGH LOCKS ARE HARD TO REMOVE WITHOUT MESSING THEM UP.	4
CLAMPS WERE IN THE WAY FOR EASE OF INSTALLATION	4
SEVERAL PANELS HAVE TO BE MOVED AROUND TH AIR INLET TO GAIN ACCESS TO THE HINGE. TEMP ON THE HANGAR DECK WAS COLD.	4
CLAMPS ARE IN THE WAY	4
Very hard to find the leak, the midwing area is very congested w/ wire bundles and hyd lines.	4
Had to move stand and excess number of times.	4
Conversion actuator s/n hard to access.	4
The upper spinner retainers are hard to get access to.	4
Component was in the cell and hard to get to.	4

S-9 Results

antenna switching unit is behind other component and the only access to it is to take out the component which adds more time to out t/s time	4
Clearance around the bolt was minute	4
Areas considered: Clearance around the system to perform maint	
FOR INSIDE FLAP SEAL BOLTS NEEDED TO REMOVE FLAP ACTUATORS. VERY TIGHT SPACE. HARD TO GET TOOLS ON BOLT HEADS	4
SHOULD BE ONLY 2 NEW NUTS (BUTS) WIRE HARNESSES INTERFER WITH THE REMOVAL & INSTALLATION OF THE PROCESSOR. YOU SOMETIMES HAVE TO TAKE SOME OF THEM OFF. TAKING 3X AS LONG TO DO THE MAINTENANCE TASK.	4
Areas considered: Number/Type of fasteners to remove to gain access to the system Clearance around the system to perform maint	
CLAMPS AND WIRE HARNESSSES GET IN THE WAY WHEN REMOVING OR INSTALLING THE GEN.	4
Areas considered: Clearance around the system to perform maint	
IF IN MAINT. MODE STAND IS NEEDED	4
the wire harness ran behind a riveted panel and had an clamp back there. We had to run a string when the old one came out to pull the new harness through	4
WAS ON THE BACK SIDE OF YOKE WHICH WAS HARD TO GET TO	4
kind of hard put on screws when your arm is fold 3 different ways	4
l/h niu awkward to remove and replace	4
A lot of panels to remove to access one component (1 dome, 3 fairings)	4
The fact you have to use a stand to deservice a system is ludicrous.	4
there is not a lot of room to work in and around the nacelle	4
Areas considered: Clearance around the system to perform maint	
Would have been easier to work on with blades unfolded	4
Areas considered: Clearance around the system to perform maint	
very confined area to work in	4
Areas considered: Clearance around the system to perform maint	
Would have been much easier with blades unfolded	4
The strap was hard to get to with the proper tools	4
Clearance was very limited. The panel which had to come off was very difficult.	4
The rope was not in the window part of the way	4
I love tight spaces were the wrenches you need don't fit	4
had to remove panels and cockpit door to assist in job	4
wia 9 is behind abiu difficult to read j3 pins	4
It was very difficult to line up the holes.	4
This task is challenging because of the lack of clearance around the hardware, and the task is much harder in helo mode	4
Areas considered: Clearance around the system to perform maint	
had to remove panels and to make job easier removed cabin door	4
Allot of panels to remove to access one compnent (1 dome, 3 bearings)	4
NOT MUCH ROOM TO REMOVE AND REINSTALL THE CLAMPs AND LINEs ABOVE THE ENGINE	4
Valve is on outside of module but we had to use a stand. Should be able to deservice inside A/C.	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
had to drop engine to get to wires easier but engine was already out	4

S-9 Results

NUMBER OF SYSTEM TO BE REMOVED	4
In airplane mode this task in near impossible	4
Areas considered: Clearance around the system to perform maint	
frustrating to be moving b-2 stand around the a/c	4
Very small opening in the twist capsule area	4
Areas considered: Clearance around the system to perform maint	
component should not be removed if you havent metered wires first. Component removal should be done if found bad or access to another area ie converter # 1	4
wing cove area under sync shaft	4
in cockpit- sliding components in was the only difficult thing	4
Areas considered: Clearance around the system to perform maint	
The fact you have to use a stand to deservice a system is ludicrous.	4
Cannot get to #7 midwing suppressor, also the lot numbers in the wing area are very difficult to read, due to how they are installed in the aircraft.	4
HAVING TO SAFTY WIRE THE CANNON PLUGS ON SOME OF THE SENSORS WAS DIFFICULT. SHOULD HAVE NON-SAFTY WIRE CANNON PLUGS	4
Lot numbers VERY hard to read due to method used to mount into wing.	4
Screws in this area usually strip very easy. Spinner cover is very unusual to work with, due to it's size. Also it usually doesn't go right on, it almost bonds where you take it off.	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
SERIAL # ON SOME COMPONENTS ARE VERY HARD TO CHECK	4
not an extremely difficult task, but ietms makes it harder that it needs to be	4
Valve is on outside of module but we had to use a stand. Should be able to deservice inside A/C.	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
WINGNUT MUST BE STOWED TO ACCESS MIDWIND GAS GENERATOR #7	4
hard to get tools into manuving position	4
Spinner dome is very cumbersome to remove. (B-2, B-1) stand must be moved to gain access to fastners, in flight ready or maintainece positions.	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
LIMITED SPACE TO GET TO ANTI-DRIVE HORN	4
Clearance around the MFD is minimal, and the unit was slightly difficult to put in because the guide pins on the mount were tight	4
Areas considered: Clearance around the system to perform maint	
Very tight areas to move and utilize tools to remove the PRGB. Constantly moving stands and ladders to gain access and perform maintenance.	4
Z-brackets is not a good job to do with the head on the aircraft	4
Areas considered: Clearance around the system to perform maint	
sealant made it difficult to rmove screws from wia.	4
The water wash receptacles need to be lower.	4
The pitot-static C/B is located behind a lot of other wiring and barely accessible with a ratchet and a 1/2 socket	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	

S-9 Results

0 panels I like that #	4
Areas considered: Number of panels to remove to gain access to the system	
Maintenance is a lot easier when the rotor head is on the stand vice being on the bird in any position, resulting in less maintenance time.	4
Areas considered: Clearance around the system to perform maint	
NEED AN EASIER WAY TO OPEN AND CLOSE AND SECURE WHILE OPEN THE PANELS FOR THE WASH NOZZLES	4
we could see it but had to improvise to get it out and put it back in	4
Hard area to get my hands into	4
Areas considered: Clearance around the system to perform maint	
SERIAL #s HART TO FIND	4
There were clamps that were hard to get at, maybe in the future the V-22 can have easier hardware to deal with	4
no real problems	4
Too small and tight of a work area	4
Areas considered: Clearance around the system to perform maint	
this task is difficult to perform	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
did op check	4
WAS ON THE BACK SIDE OF YOKE WHICH WAS HARD TO GET TO	4
VERY HARD TO GET TO COMPONENT, NEED MORE CLEARANCE	4
Sliding the MFD in onto it's alignment pins can be tricky due to it's weight	4
not much in the way of clearance	4
Areas considered: Clearance around the system to perform maint	
Tryinbg to get the spinner dome holes to line up in order to get the screws in was a pain	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
Would have been easier to remove the CDD in airplane mode	4
ietms does not call for the removal of any panels which is not the case	4
There are too many wires around the component, and risk of damaging them is high	4
Areas considered: Clearance around the system to perform maint NBC equipment Cold weather equipment	
Camera mod was in the way.	4
the clearance around this item is challenging to work around	4
Procedures were done in helo mode witch made it a little difficult to reach.	5
The blades were folded horizontally, made if more difficult	5
Tight in some places places under floor boards.	5
removing the fcc was relatively easy and functional check there was more than enough room	5
HAD TO PUT AIRCRAFT ON JACKS	5
HAD TO REMOVE SOUNDPROOFING TO GET TO PORT	5
SAFETY CONCERN - MARINES ON TOP OF NACELLE	5
NEEDED WORKSTAND TO REACH AND A LADDER TO GET TO IT FROM UNDERNETH	5
requires a technicians to crawl under aircraft to re-hang weights several times	5
had to remove sealant fairing assembly to perform maintenance	5

S-9 Results

Had to remove a panel on L/H green blade, was at the top of inverted Y	5
Was fairly easy with the rotor head off	5
We had to tie the fairing up but the click stud was easily accessible.	5
Job was done in helo mode, this made the job a little more difficult to perform.	5
NEEDED WORKSTAND TO GET TO LOCATION	5
it would be easier to install if it was on a mount with lock studs to secure it.	5
Areas considered: Clearance around the system to perform maint	
IT WAS ON THE BACK OF THE YOKE, WAS HARD TO WORK ON WHILE ON THE WORK STAND	5
HAD TO WORK AROUND SEAT	5
Had to convert to a/p mode and the back to helo mode, rotate the hub and then convert back down to a/p mode.	5
WASH RECEPTECALs SHOULD BE IN UNDER THE WINGS	5
WATER WASH RECEPTECALs SHOULD BE LOCATED UNDERNEATH THE WING TO MAKE IT EASIER	5
Panels that need to be removed cannot be removed in airplane mode.	5
IN CABIN DESERVICING WOULD BE MUCH MORE CONVIENT	5
Needed to use a work stand.	5
Requires a stand.	5
tight area	5
Line connection to reservoir is in a tight place. Line to heat exchanger is only hard to reach and maintain. The stand cannot get that close to the nacelle with the maintenance door opened.	5
We had to remove a click stud to get the line out.	5
LOWER AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS YOU ARE IN FRONT TO VALVE LAYING DOWN, POSSIBLE SAFETY VIOLATION LAYING DOWN IN FRONT OF COMPRESSED NITROGEN, WHILE HOOKING UP HOSE AND CLOSING VALVE DEFLATING.	5
CAN BE HARD TO GET TO WHEN A/C IS IN VERTICAL POSITION	5
small area to work around near pdp 3	5
BATTERY WAS A LITTLE HEAVY AND IS INSTALLED OVERHEAD IN CABIN	5
BATTERY IS QUITE HEAVY TO CARRY AND INSTALL IN THE OVERHEAD PORTION OF THE CABIN, AND CLAMPS ARE IN THE WAY OF PUTTING IT IN EASILY	5
Areas considered: Clearance around the system to perform maint	
LOWERE AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS ONE IS IN FRONT OF AIRCHARGE VALVE LYING DOWN. POSSIBLE SAFETY VIOLATION TO HAVE FACE THERE IN FRONT OF COMPRESSED AIR	5
Had to get work stand to get up to nacelle to deservice hydro system.	5
Had to use stand	5
LOWERE AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS ONE IS IN FRONT OF AIRCHARGE VALVE LYING DOWN. POSSIBLE SAFETY VIOLATION TO HAVE FACE THERE IN FRONT OF COMPRESSED AIR	5
Akward position	5
Little tight installing nut cage	5
HAD TO PUT AIRCRAFT ON JACKS.	5
When blades are folded, it makes it difficult to work on	5
Areas considered: Clearance around the system to perform maint	
HAD TO USE A B-2 STAND WHICH IS TO BIG AND BULKY	5
TIGHT FIT	5

S-9 Results

REMOVED SWIVEL W/NACELLE HORIZONTAL. WAS MODERATELY TIGHT AREA CAN BE REMOVED IF TOP PANEL IS REMOVED. ACTUALLY IMPROVES ACCESSIBILITY FOR REMOVAL/INSTALLATION.	5
The central de-ice distributor is removed easier when the aircraft is in airplane mode	5
HAD TO MOVE STAND TO ACCESS AREA- TOP/SIDE FRONT	5
Small area to work in, but the maintenance was not difficult to perform	5
Too many fasteners on the panel requiring removal	5
Areas considered: Number/Type of fasteners to remove to gain access to the system Clearance around the system to perform maint	
STAND HARD TO MOVE WITH ONE PERSON	5
Easier with the head on the stand	5
Was hard to get at the dogbone because of the wires	5
HARD TO INSP AROUND TOP PORTION OF ENGINE	5
After removing the dampener hub, the CD is much easier to get to.	5
Can be difficult depending on the position of the nacelles, it is much easier in airplane mode	5
ACTUATOR WAS A LITTLE HEAVY	5
Easy to access the area in the nose compartment	5
All we needed to do was T/S the system by ohming out some wires	5
HAD TO REMOVE CONVERSION ACTUATOR PANEL. HARD TO GET TO MINI MARKS ON PANEL TO REMOVE AND INSTALL	5
easy access	5
required removal of aircrafts life rafts	5
number of other components to move	5
STAND NEEDED	5
The only minor problem was sliding the new MFD into place.	5
B-2 STAND HARD TO USE	5
wire bundle in front of the TDP makes it complicated to take it out as well as put it in,	5
HAD TO USE A B-2 WHICH IS TO BIG AND BULKY	5
if we had a stand to safely perform maintenance at this height, this system would be easy!	5
component was in midwing gear box very easy to get to	5
had to remove are large panel, but the clearance in the midwing compartment was good	5
A/C IN HELO MODE	5
FLAP LEADING EDGE HARDWARE NEEDS TOBE BOLTS	5
The task was easier because the head was off the aircraft.	5
We had to remove the slip ring to get to the torque sensors, which is difficult	5
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
Too many clamp stack-ups easily cause FOD and assembly adds hours to this task because there is no reference on how to reinstall.	5
Areas considered: Number/Type of fastners to remove to gain access to the system	
HAD TO CRAWL ON HANGAR FLOOR TO GET THE TIRES. FLOOR WAS COLD	5
Tight area	5
Areas considered: Clearance around the system to perform maint	
easy to get to	5

S-9 Results

TEMP ON THE HANGAR WAS TOO COLD	5
A/C WAS IN HELO MODE	5
HAD TO USE A B-2 STAND WHICH IS TOO BIG AND BULKY	5
HAD TO GET A WORKSTAND TO GET TO LOCATION OF DESERVICING PORT	5
Too many panels to remove.	5
IT WAS EASIER TO PULL THE LOWER DOOR OFF AND REPLACED THE LATCH IN THE SHOP	5
Had to use workstand to get to blade fairing.	5
Not exactly easy maintenance, but it can be done when it has to be done.	5
IT WAS ON THE BACK OF THE YOKE, WAS HARD TO WORK ON WHILE ON THE WORK STAND	5
Most tasks can be done with ease, but some are located in areas with little or no access, making them extremely difficult.	5
Overhead panel	5
Areas considered: Clearance around the system to perform maint	
It is very hard to disconnect the 3 links supporting the engine, but can't really see how to make it easier, but it needs to be easier.	5
The front of the nacelle has to be taken apart which consumes a large amount of the time for this task. Even after everything is taken apart getting to the lower PRGB bolts is difficult and getting some of the air baffle bolts is very difficult.	5
B-2 STAND WAS HARD TO MOVE WITH ONE PERSON	5
The nacelles should be in airplane mode to do this task	5
HAD TO SLIDE ON THE FLOOR, AND IT WAS COLD	5
YOU HAVE TO LAY DOWN ON THE FLOOR TO GET TO IT AND THE DECK WAS COLD	5
Areas considered: Clearance around the system to perform maint Cold weather equipment	
HAD TO USE A WORKSTAND TO GET TO LOCATION OF RESERVOIR	5
Not very much clearance.	5
Areas considered: Clearance around the system to perform maint	
YOUR ARMS GET TIRED AFTER A WHILE, BUT ACCESSIBILITY IS GOOD	5
WOULD BE EASIER IN HELO MODE	5
NEEDED A WORKSTAND	5
HAD HARD TIME MANEUVERING HYD THROUGH HANGAR WITH ALL FOUR A/C UNSTOWED IN FLIGHT READY	5
NEEDED WORKSTAND TO GET TO LOCATION	5
IN CABIN DESERVICING WOULD BE MUCH MORE CONVIENT	5
We had to tie the fairing up but the click stud was easily accessible.	5
Had to use stand	5
IF NACELLES IN HORIZONTAL B-1 REQUIRED. IF NACELLES ARE IN VERTICAL POSITION 2 PERSONNEL ARE REQUIRED	5
IF NACELLES ARE HORIZONTAL THEN A B-1 STAND IS REQUIRED AND THERE IS NOT A PROBLEM. IF NACELLES ARE VERTICAL 2 PERSONS ARE REQUIRED AND PANEL IS TO HIGH TO REACH W/ B-1	5
HAD TO USE 90 DEGREE DRILL ADAPTER TO DRILL OUT HOLE	5
CAN BE HARD TO GET TO WHEN A/C IS IN VERTICAL POSITION	5
SOME PANELS NEED WORK STANDS TO REACH	5
all in avionics bay	5
system was easy to access but hard to insatl	5

S-9 Results

ONE CLAMP BESIDES THE BATTERY GETS IN THE WAY WHEN INSTALLING	5
Areas considered: Clearance around the system to perform maint	
THIS COMPONENT WILL BE EXTREMELY DIFFICULT TO CHANGE OUT UNDER EXTREME WEATHER CONDITIONS, WITH HEAVY GLOVES, OR WHILE WEARING NBC GEAR	5
Pilot's need not to push down on indicator lights so hard as to not break them, and the bulbs can be changed with minimal effort.	5
The componant was hard to get to, making the task much more lengthy	5
This actuator was fairly easy to access. The clearance around the actuator was tight but not impossible.	5
Areas considered: Clearance around the system to perform maint	
On top of aircraft by rudders	5
Access to the yoke is very limited.	5
Cockpit door presented a problem by getting in the way of area to be maintained	5
it was hard to get to some of the safety wire on the main seat bolts on both seats.	5
NEEDED WORK STAND	5
THE CRAMPED COCKPIT MADE IT DIFFICULT TO GET SOME PARTS	5
although we have had several gripes on this sytem to make us as proficient as we are on generators	5
Requires a stand.	5
SMALL AREA TO WORK IN	5
Ladder/stand needed to perform task, which takes up more time.	5
WE HAD TO REMOVE FLOORBOARDS	5
we should do away w/ retaining rings. They are a pain in the ass. They constantly come off and we usually spend more time looking for them than doing the job	5
CLICKSTUD IN A TIGHT SPOT ON ROTORHEAD. HARD TO GET TO.	5
HARD TO REMOVE SOUNDPROOFING TO GET TO	5
HAD TO REMOVE SOUNDPROOFING TO GET TO PORT	5
PILOTS SEAT MAKES IT INCONVIENCE AND TIME CONSUMING	5
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
SAFETY CONCERN - MARINES ON TOP OF NACELLE	5
the bottom (when in helo mode) BACK BOLT IS IMPOSSIBLE TO GET OUT BECAUSE OF BOTTOM TERMINALS	5
NEEDED LADDER TO REACH.	5
The system needs to be loaded by a separate cable. IT ISN'T BAD OR TOO HARD, BUT IT SHOULD BE ABLE TO TO BE LOADED THROUGH THE REGULAR MLV PORT	5
IT WAS KIND OF TIGHT GETTING A WRENCH AROUND THE LAST TWO NUTS	5
Quick disconnect fittings should be installed for quicker connections from HSU to aircraft. It would be a lot messier also.	5
NEEDED WORKSTAND TO REACH AND A LADDER TO GET TO IT FROM UNDERNETH	5
HAD TO PUT AIRCRAFT ON JACKS.	5
WORK STAND REQ'D. FRONT OF STAND MUST BE REMOVED (SAFETY RAIL) TO ACCOMMODATE LARGE SIZE OF PANEL AND THE ACCESIBILITY OF TWO MAINT. PERSONNEL.	5
HAD TO PUT AIRCRAFT ON JACKS	5
Akward position	5
goes with the territory (A/C)	5
HAD TO REMOVE A LOT OF COMPONENTS IN ORDER TO BEGIN WORK ON THE TASK	5

S-9 Results

THE ELECTRONIC LOCKS AND SENSOR ARE IN THE WAY BUT THERE IS A WAY TO WORK AROUND	5
PULLING LARGE PANELS IN WIND IS AN ACCIDENT WAITING TO HAPPEN PANEL COMING OUT OF HAND AND DROPPING	5
some bolts are in tight hard to get to places	5
very little clearance	5
NOT TO HARD TO GET TO BUT A LOT OF LITTLE WIRE CLAMPS HERE AND THERE THAT TAKE UP EXTRA TIME	5
Little tight installing nut cage	5
EVERYTHING WAS FAIRLY EASY TO GET TO EXCEPT FOT CV-1 WHICH HAD TO TAKE OUT KY-58'S AND THE MOUNTS THEN TAKE OUT A PANEL THEN ALL THE CONNECTORS (X2) WAS ON THE SIDE PLUS TWO NUTS TERMINALS	5
WIRE BUNDLES IN THE WAY TO THE LEFT AND RIGHT	5
This actuator was fairly easy to access. The clearance around the actuator was tight but not impossible.	5
Areas considered: Clearance around the system to perform maint	
We had to remove a click stud to get the line out.	5
Line connection to reservoir is in a tight place. Line to heat exchanger is only hard to reach and maintain. The stand cannot get that close to the nacelle with the maintenance door opened.	5
tight area	5
CLICKSTUD WAS IN A TIGHT SPOT ON ROTORHEAD. HARD TO GET TO	5
Allot of panels to get access	5
HAD TO REMOVE A LOT OF ITEMS IN ORDER TO BEGIN WORK. ENDS UP BEING A DAY JOB	5
When the A/C is in pitch lock the PRGB dust cover is impossible to remove.	5
bus health monitor for env bus #2 is barred behind cv-2 below pdp 2 which is a lengthy access	5
WORKSTAND REQUIRED . FRONT OF STAND MUST BE REMOVED TO ACCOMMODATE FOR LARGE SIZE OF PANEL AND ACCESSIBILITY OF TWO MAINT. PERSONNEL.	5
the rotor head is very tight to insp. W/the panels on	5
WATER WASH HOOK UPS MORE ACCESSIBLE, LIKE NEAR GROUND LEVEL	5
HAD TO REMOVE A LOT PANELS WITH A LOT OF SCREWS AND CLICK STUDS	5
slightly difficult to get to	5
SOME MMIV FASTNERS ARE BEHIND CONVERSION ACTUATOR	5
IT IS HARD TO SAFETY WIRE THE SEAT MOUNTING BOLTS.	5
the rotor head is very tight to insp w/the spinner dome and panels on	5
have to actually remove & replace programmer for this task	5
Areas considered: Clearance around the system to perform maint	
HARD TO REMOVE SOUNDPROOFING TO GET TO	5
ONE OF THE CLICKSTUDSWAS HARD TO GET FROM THE BACK HAD TO USE SAFETYWIRE TO PULL IT UP FROM THE TOP. MAYBE THAT SHOULD BE ADDED TO IETMS	5
LOWER AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS YOU ARE IN FRONT TO VALVE LAYING DOWN. POSSIBLE SAFETY VIOLATION LAYING DOWN IN FRONT OF COMPRESSED NITROGEN, WHILE HOOKING UP HOSE AND CLOSING VALVE DEFLATING.	5
WIRE CLAMP IS IN THE WAY ON NEIGHBORING WIREBUNDLE WHEN REMOVING OR REPLACING	5
Areas considered: Clearance around the system to perform maint	
Not very much room around the nose area.	5
Could not get to sample parts very well due to sound proofing.	5

S-9 Results

DIFFICULT BUT POSSIBLE TO READ C/P'S FOR T/SING	5
HAD TO CRAWL UNDERNETH AIRCRAFT TO GET TO LANDING GEAR DOORS	5
pretty tight area.	5
Not very much clearance.	5
Areas considered: Clearance around the system to perform maint	
NEEDED A WORKSTAND	5
ONLY HAD TO REMOVE UPPER CREW DOOR FROM A/C TO GAIN ACCESS	5
A little hard to reach the top screws.	5
As per IETMs the nacelles horizontal, blades folded, one spinner panel is difficult to R2	5
Needed a workstand to get to location, had trouble reaching the top mini-mart on fairing from workstand.	5
Some of the panels are difficult to get to.	5
For the actuator to be removed by sling threw top of nacelle the swashplate must be pulled out or disconnected.	5
there are few panels to remove and same sound proofing to move but nothing extremley difficult to get around	5
ONLY HAD TO REMOVE TWO PANELS FROM THE DOOR TO GAIN ACCESS TO THE WINDOW PIN. ALSO HAD TO REMOVE SOUND PROOFING FROM DOOR	5
a lot of stands had to be moved around to remove fairings.	5
IS LOCATED BEHIND SOUNDPROOFING	5
HAD TO USE WORKSTAND TO GET TO TASK	5
Job was done in helo mode, this made the job a little more difficult to perform.	5
THIS JOB WAS EASILY ACCESSIBLE NO PROBLEMS	5
it was fairly easy to get into panel and rubbing was in front	5
NO SPECIFIC TQ ON RETAINER BOLT	5
HAD TO WORK AROUND SEAT	5
It is much easier to get to the top of the actuator if the head is off the plane, A/F should go first on a head install.	5
Hard to manuver for removal. Had to remove more panels than IETMs called out for.	5
RETAINER BOLT VERY WEAK. NEED A SPECIFIC TORQUE	5
HAD TO REMOVE A CONNOR PLUG TO GET TO SURFACE WHERE CLICKSTUD WAS PLACED	5
Aft screws are really difficult to get to.	5
SOUNDPROOFING HAD TO BE REMOVED TO DO THE JOB	5
RETAINER BOLT VERY WEAK AND COULD BREAK EASILY	5
NO SPECIFIC TQ ON RETAINER BOLT	5
GREASE FITTINGS ON INSIDE BOTTOM OF SWASHPLATES REQUIRES A 90 DEGREE GUN ADAPTER TO BE ABLE TO GREASE THEM	5
Stand wouldn't reach	5
Areas considered: Clearance around the system to perform maint	
HAD TO REMOVE SOUNDPROOFING. QUICK DISCONNECTS BE MORE SUITABLE FOR TASK AND WOULD MAKE TASK EASIER.	5
Needed stand to complete task, it was hard to move around. In cabin deservicing would be outstanding.	5
you have to be very flexible to get position take of this clamp	5
Needed a ladder and a workstand.	5
mfd are easily accessed	5

S-9 Results

BAFFLE IS LOCATED IN RIGHT NACELLE ON CROSSMEMBER. KIND OF TIGHT FIT TO INSTALL BAFFLE AS WIRE BUNDLES AS ARE PRESENT BUT NOT EXTREMELY DIFFICULT	5
a/c has to be in stow position to get to number 7 gas generator	5
HAD TO REMOVE WIRE CLAMPS TO REMOVE BAFFLE	5
Once the head was on the deck, made a big difference	5
tight area and hard to torque	5
Floor boards had to be pulled to insp. Area under them.	5
Areas considered: Clearance around the system to perform maint	
Had to get work stand to get up to the nacelle to deservice the hyd system.	5
Task included serialization- conversion actuator assembly serial number; quite difficult to find and access	5
tight area and hard to torque	5
Needed a stand to get to nacelle. In cabin deservicing would be outstanding.	5
wire harness doesn't have enough slack to install it properly something to consider in the future	5
GREASE FITTING CLOSEST TO ANTIDRIVE ARM RESTRICTS ACCESS TO VALVE WITHOUT 90 DEGREE ANGLED HIGH PRESSURE FITTING. ALSO THE PANEL TAKEN OFF DID NOT GIVE MUCH ROOM TO GET ACCESS TO THE CLOSEST VALVE ON THE INBOARD SIDE	5
no complaints	5
all we had to do was run a pf bit and watch to see if the rudders move	5
the accessibility is surprising good only one panel must be moved to get to the gen and perform maintenance	5
THIS TASK WAS REALLY EASY BECAUSE THE ROTORHEADS WERE OFF OF THE A/C	5
Had a hard time lining up click stud with Z bracket. Could not use plastic applicator on clickstuds.	5
Areas considered: Clearance around the system to perform maint	
NEEDED A WORKSTAND	5
Work stand is required.	5
no complaints plenty of clearance	5
the search light was easily accessible which made maintenace quick and efficent	5
ACTUATOR IS FASTENED BY FOUR NUTS AND BOLTS. TO ACCESS THE NUTS REQUIRES A FLOOR BOARD TO BE REMOVED. TASK WOULD BE FAST AND EASY IF THE BOLTS HAD NUTPLATES.	5
IT WAS ON THE HEAD WHICH WAS OFF THE A/C AND ON A STAND AT THE TIME	6
TOOK DOOR OFF AND BROUGHT TO SHOP	6
Getting in/out of cockpit, working with CDU/MFD's	6
There is only one panel to remove, and computer is easy to replace	6
HEAD WAS ON STAND	6
WE TOOK IT OFF AND BROUGHT IT IN THE SHOP	6
easy panel to open with quick fastners can be performed easily in airplane or helicopter modes	6
this task is easy to perform	6
RELATIVE TO TASK AT HAND	6
Very easy to get to area to work be worked on	6
Areas considered: Clearance around the system to perform maint	
TOOK 1 PANEL OFF ON DOOR	6
DOOR WAS IN SHOP	6

S-9 Results

needs to be mentioned in ietms when removing bateries for inspection(specify exactly that they need to be removed one at a time like ietms says but there needs to be atleast one battery in at all times so the gps reciever does not lose its codes	6
PROPROTOR AREA, SPINNER/DOME PANELS EASILY ACCESIBLE	6
REMOVED 1 PANEL	6
the component was easily accessible	6
ROTORHEAD WAS ON A STAND WITH EASY ACCESS	6
Baffle located in L/H nacelle	6
TOP OF WING	6
there was plenty of room around the component so that the removal and installation was fairly easy	6
Areas considered: Clearance around the system to perform maint	
IN VERT. POSITION PANEL WAS ACCESSIBLE. DID NOT SEAL PANEL WITH NACELLES IN HORZ. POSITION AS CALLED OUT IN IETMS	6
HAD TO USE WORKSTAND TO GET TO A/C	6
CLIMBED ON TOP OF A/C WIPED OFF WITH RAG AND GLASS CLEANER	6
I leak checked line and retorqued it in the fold/stowed position. It could be reached from the top and bottom of the midwing.	6

S-9-3-3

MXA01: Rate the accessibility to the system/component being maintained for this task.

Comment Total Responses 536 (Avg.) 4.2

Plus the stack up info was not in IETM, had to use blue prints which may not always be available	2
Areas considered: Clearance around the system to perform maint Cold weather equipment	
Too many panels to take off to gain access to the shear pin, and because of their location above the engine intake, the possibility of dropping F O into the intake is ever present	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
If acft went down in the field, we would never get to the CDD	2
Areas considered: NBC equipment	
Far too many fasteners to take out in 1 panel. Three different tools were needed, an apex, and two different sizes of offsets were required. Also, due to the location, the possibility of dropping a tool or fastener down the intake is bad	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
This task would not be able to be done in the field, because stands that could reach the top of the heads would be required	2
Areas considered: Clearance around the system to perform maint	
NEEDS QUICK DISCONNECTS AT SERVICING PORTS	2
FASTENERS WAS HARD TP GET INTO HOLES. THE HYDRAULIC LINE DOESN'T LIKE TO LINE UP SO YOU CAN PUT IT ON. WE HAD TO TAKE OFF BOTTOM END OF SWIVEL TO GET HYD LINE TO LINE UP.	2
Really hard and time consuming to get the access panel off.	2
ACCESS TO THE ARE WHILE ROTORS ARE TURNING IS DIFFICULT AND OPENING THE PANEL IS EVEN HARDER (SHIP ROLLING AND WINDS) WASH FITTINGS SHOULD BE SOME WHERE LOWER ON THE AIRCRAFT	2
Areas considered: Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint Cold weather equipment	
Anti-drive assembly has to be disconnected to get access to valve.	2
too many fastners	2

S-9 Results

cannon plugs on back of wia 12 awkward to reach	2
c/p's on the rear or wia 12 awkward to reach	2
see question # 4	2
Only way to gain access to this area is with a large/tall stand	2
depends on swashplate position (fwd/aft) weather we have to take off lower panels also have to take off spinner dome to get access	2
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
Space is difficult to get hands into.	2
I SHOULDN'T HAVE HAD TO ACCESS IT BECAUSE IT IS A 6115 JOB, NO A 6155	2
HAD TO REMOVE SEVERAL WIRE BUNDLES FROM AIRCRAFT TO REMOVE SWASHPLATE ACTUATOR	2
DOGBONE IS VERY UNACCESSIBLE	2
While removing and installing the generator, the left hand beam and wire bundle get into the way. About 1-3in more space would decrease the chance of damage to the generator, wire bundle, fairing support beam, midwing gearbox drive shaft, coupling, and wing stow ring.	2
When the aircraft is in helo mode this job is very hard	2
B1 runs under the proprotor gearbox, if the wire needed repai, the gearbox would require removal in order to access the wires	2
Areas considered: Clearance around the system to perform maint	
To many screws to many panels.	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
very hard to reach inside to get all the dirt out	2
NEED B-2 STAND TO REACH BLADE FAIRING OF A/C IN VERTICAL POSITION.	2
The l/h green blade was at the top of the inverted Y, making it much more difficult to access the leading edge.	2
there should be easier way to locate and replace this switch	2
Areas considered: Number of panels to remove to gain access to the system	
There are a lot of fasteners to remove the 2 panels covering the nacelle motor.	2
accessibility to the switch is acceptable, but the harness is too short from switch to disconnect	2
The spindle bearing is difficult to access with the borescope.	2
The cannon plug on the back of the spinner dome is very difficult to reach as well as attach and takeoff. If the wires were 2 inches longer it would more than likely solve the problem.	2
Had to remove the spinner to access this component. Removing the spinner and screws can be difficult. Each removal usually involves stripped screws. Component tough to access in rotor head.	2
Panels sometimes hard to line up fastener holes. You can't see how to line up the holes because the retaining clips that keep the fasteners in the panel severly hamper visibility. Maintenance stand usually has to be moved around 2 or 3 times to access leading and trailing edge fasteners. Also retaining rings also have unique ability to dissappear creating fod hazards.	2
Stand would not reach high enough	2
Areas considered: Clearance around the system to perform maint	
hard to reach all the areas to clean out the dirt	2
HAD TO REMOVE SEVERAL COMPONENTS (4) ESPECIALLY THE (HUD) CONTROLLER JUST TO INSTALL	2
To R&R generator is like putting together a puzzle in order to make it fit in the hole and into place.	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	

S-9 Results

B1 data-bus is routed under the prop-rotor gearbox. Had it been a broken wire, the gearbox would have to be removed in order to repair the wire	2
Areas considered: Clearance around the system to perform maint	
to reconnect the cannon plugs on the wia one would have to be very careful not to bin the pins on the cannon plug but at the same time very evry skilled at maneuvering large things in small tight places	2
safety wire the inside screws was a bitch. I didn't have experience	2
In order to deservice, access to the left and right nacelle is required. For ease of task and expediency, hyd bleeding from cabin would be extremely acceptable. One person would only be required, as access toview HFLM would be available.	2
In order to de-service access to L/R nacelle H/hydraulic module required. For ease of task and expediency, cabin bleeding would be extremely acceptable. One person would only be required then.	2
No way to get z solid bite with the socket, the wire bundles are too close to the dogbone top and bottom cotter pins were next to impossible to install	2
SEALENT ON HEAD OF BOLTS MAKES TASK DIFFICULT. SEEMS LIKE OVERKILL.	2
the cannon plug for indicator should have more slack so the indicator can come out of the panel completely and further not have to be removed panel near pilots peddles. Also once panel is removed access to cannonplug is difficult	2
INBOARD SWASHPLATE NOT EASY TO GET TO.	2
WHEN HEAD WAS ON THE FLOOR ACCESSABILITY WAS OK, BUT YOU COULD BARELY SEE WHAT YOU WER DOING. ONCE HEAS WAS ON THE A/C YOU HAD TO SET ON THE BOTTOM BLADE AND TAKE YOUR CRANIAL OFF TO GET IN A POSITION TO SEE WHAT YOU WERE DOING THAT IS WITH THE BLADES FOLDED AND NACELLES IN HORIZONTAL POSITION	2
these components are hard to reach and hard to tighten	2
intermittent failure once could not discover what component failed if any	2
IETMs says for blades to be folded and nacelles horizontal. We had the plane in helo mode and had no problems but our arms getting tired.	2
Had to stand intake	2
There is a 6" X 2" square for me to stick my head and arms to meter the wires. The man who designed this A/C did not realize the maintainer may need to access this area.	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
MINIMARK STRIPS TO EASY AND RETAINERS COME OFF ALL THE TIME. THEY ARE A FOD HAZARD	2
Some areas have little or no access for the use of tools. (ie. Aft PRGB firewall) This task took 3 hours to remove 7 or 8 screws.	2
If in the field, could not do job because of high location on the hub	2
Areas considered: NBC equipment	
No B-1 stands, so I had to climb up onto nacelle and stand on the intake	2
Areas considered: Clearance around the system to perform maint	
If aircraft went down in the field, the job would be really be difficult given the location of the pins	2
MUST HAVE A BETTER WAY TO ACCESS THE PITCH CONTROL RODS. REMOVING THE SPINNER PANELS IS TOO TIME CONSUMING	2
If aircraft was in the field, we would not be able to repair this harness or wires in this area because it would be inaccessible.	2
THE LOOK DOWN WINDOW IS TO SMALL AS AN ACCESS PANEL TOO.	2
In the field we couldn't do this because of lack of support equipment	2
Areas considered: NBC equipment Cold weather equipment	
Task would have been much easier if acft was in maint mode position	2
Would have been easier and safer in Maint mode position	2

S-9 Results

This could not be completed if A/C went down in the field, no way to repair wires in airplane mode and extremely hard to do in helo because there is no way to get up on the hub.	2
Areas considered: NBC equipment Cold weather equipment	
If in the field, support equipment would not be readily available, and access to the top of the hub would be difficult	2
Way too many panels and fasteners to remove.	2
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
THE SPACE WHERE THE WORK IS DONE IS TOO CROWDED	3
AREA AND CONFIGURATION OF BRACKET SOMETIMES MAKES IT DIFFICULT TO BE ABLE TO HOLD ON TO THE HARDWARE OR INSTALLATION HARDWARE WITHOUT DROPPING IT	3
plcu rubs on c/p's and will eventually causes chaffed wires	3
Areas considered: Number of panels to remove to gain access to the system	
Camera mod was in the way.	3
SCREWS SEEMED TO STRIP EASILY	3
The flight control module is hard to reach with the B-1 stand and the B-2 stand is to tall. In field conditions it would be impossible to do this task without a stand. None of the stands that are tall enough to fit in the back of the V-22.	3
hard to look inside the intake or get one hand in there to work because the area is to small	3
Was very hard to reach	3
wire bundles do not belong clamped in front of removable components because everytime that part is pulled you rub the wires and will eventually cause wire chaffing and/or breakage of wires	3
Areas are hard to reach, and the bolts behind the CDD are very difficult to reach	3
KIT-1C mount was in the way of the back screws, and had to be unmounted to gain access.	3
Areas considered: Clearance around the system to perform maint NBC equipment Cold weather equipment	
The plane was in airplane mode, which made reaching the lower/back side of the swashplates difficult to access	3
Areas considered: Clearance around the system to perform maint	
FLOORBOARDS ARE HARD TO PULL OUT AND NEED TO BE IN 2 PIECES	3
HARD TO GET TO THE STOWRING AND NEXT TO IMPOSSIBLE TO SEE THE WINGLOCK PINS	3
some things required for t/s were well spaced to far aparts	3
panels r613 are hard to get to either removal or install	3
The clamp and hardware stack-up is not in IETM's	3
SPINNER PANEL FASTENERS CAN BE DIFFICULT TO ACCESS	3
SPINNER PANEL FASTENERS CAN BE DIFFICULT TO ACCESS	3
IT WAS TOO CROWDED	3
FLOORBOARDS ARE A PAIN TO GET OUT	3
for a crucial component such as this its ridiculous to pull off that many fastners on one panel	3
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
had harnesses had to reach inside head itself	3
#4 hanger bearing grease fittings are very hard to reach with a grease gun	3
The APU Fuel feed line should be clamped more. The line receives a lot of vibration and will probably continue to come loose over time	3
the harness part of a control feature that allows the nacelles to be lowered . It was severed and the nacelles would not lower . Therefore gave us the trouble getting to the harnessr	3

S-9 Results

wia 9 is behind abiu- difficult to read t3 pins	3
the wire bundles in front of compartor make it difficult to install/ remove cannon plugs, install compartor. Also had to remove hud/nvg controller which is extra work. It is also difficult to install screws	3
strip because their screws should be a bolt	3
Areas considered: Number/Type of fastners to remove to gain access to the system	
having to remove the spinner makes this task more than twice as long to complete	3
Areas considered: Number of panels to remove to gain access to the system	
hidden by other componets. Could not fit tq wrench to get proper tq.	3
It is very difficult to inspect the inner diameter of the stowring because there are only small access points which do not allow full access to the stow ring.	3
LOWER GIMBEL EXPANSION PIN IS BARELY ACCESSABLE. THE WING HAS TO BE STOWED TO GET TO IT	3
The flight control module is hard to reach with the B-1 stand and the B-2 stand is to tall. In field conditions it would be impossible to do this task without a stand. None of the stands that are tall enough to fit in the back of the V-22.	3
The mag plugs and oil filter cannot be inspected on a daily. Multiple panels must be pulled to access the area. They should have quick access pannels for daily's	3
while trying to install wire thru clamps need to move panel just for one clamp cuz it is hard to guide it thru.	3
THE SCREWS ARE VERY EASILY STRIPPED	3
IF THE LOWER NACELLE PANELS HAD LATCHES INSTEAD OF SCREWS LIKE THE NACELLE DOORS DO THIS TASK WOULD BE CUT IN HALF.	3
tough to check power directly from gen #2 w/engine turning	3
HAVE TO REMOVE ALMOST ALL FORWARD NACELLE PANELS TO GET TO BOLTS IN AIRPLANE MODE	3
HAD TO USE PLIERS AND FLASHLIGHT AT THE SAME TIME. COTTER PINNING IT WAS VERY HARD AND PAINFUL	3
Access is extremely limited.	3
PANEL NOT EASY TO WORK AROUND	3
Hard to get to the link to torque it.	3
WITH THE GIVEN LOCATION OF ENGINE ROTORWASH ATTAHMENT FITTINGS, ACCESS IN ONLY AVAILABLE WITH B-1 STANDS	3
Areas considered: Number of panels to remove to gain access to the system	
Minimark fasteners strip out too easy	3
Very hard to get to areas under the CDD when in helo mode, tight cinfines made it very easy to drop tools and hardware.	3
Areas considered: Clearance around the system to perform maint	
ACCESS IS DIFFICULT. LIMITED AREA DUE TO I/R SUPPRESSOR DUCT	3
TOO MANY WIRE HARNESSSES TO DISCONNECT. 4-6 HOURS REQUIRED TO UNDUE AND REDUE WIRE BUNDLES. ALL AROUND INTERCOSTAL . WIRE SHALL RUN BEHIND ACTUATOR NOT IN FRONT. INTERCOSTAL SHOULD HAVE SCREW WITH BOLT HEAD. NEED 3 ATTACHMENT POINTS FOR SAFETY HARNESS ES	3
could use more room for your hands for the c/p's on the bottom firewall	4
The upper spinner retainers are hard to get access to.	4
fairly easy to get access to for nut somewhat difficult to align to cotter key	4
THE CLAMPS PREVENT EASILY REMOVALAND INSTALLATION	4
CLAMPS WERE IN THE WAY FOR EASE OF INSTALLATION	4
Captive fasteners are very easy to break and lose. Areas to different sections of engine are sometimes very difficult to access.	4
Captive fasteners are easily broken.	4
The captive fasteners are easy to brake.	4

S-9 Results

HAD TO REACH INTO A SMALL TIGHT SPOT ON THE A/C.	4
A/C is very hard to get clean. Different wash equipment and procedures might need to be used.	4
Space was difficult to work in	4
Very little clearance around the area that is being worked on.	4
Had to move stand and excess number of times.	4
no panels , no loose hardware, nothing to bag and tag. I like this job	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
Very hard to find the leak, the midwing area is very congested w/ wire bundles and hyd lines.	4
HANGAR WAS COLD	4
Z BRACKET IS HARD TO GET TO. IT IS A SMALL SPACE	4
THESE Z BRACKETS ARE A MAINTAINERS NIGHTMARE. THEY ALSO FORCE OUR WIRE HARNESS TOO CLOSE TO THE DOG BONE, ALSO ARE VERY HARD TO SAFETY WIRE IN THAT CLOSE PROXIMITY	4
Helo mode only a B-1 works	4
SOME OF THE SCREWS THAT HOLD THE WINDOW IN STRIPPED OUT WAY TO EASY	4
SEVERAL PANELS HAVE TO BE MOVED AROUND TH AIR INLET TO GAIN ACCESS TO THE HINGE. TEMP ON THE HANGAR DECK WAS COLD.	4
Nacelle area extremely crowded.	4
Areas considered: Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
in opposite avi panels	4
The blade fairings was in flight ready position, it was difficult to access. Large maintenance stand required stand is cumbersome and difficult to position by one maintainer. If two or more blades were needed to be accessed it would be frustrating to keep moving the stand.	4
CLAMPS AND WIRE HARENESSES GET IN THE WAY WHEN REMOVING OR INSTALLING THE GEN.	4
Areas considered: Clearance around the system to perform maint	
antenna switching unit is behind other component and the only access to it is to take out the component which adds more time to out t/s time	4
YOU MUST HAVE A B-1 STAND OR THE TASK CANNOT BE PERFORMED	4
WITH BOLT BENT ITS KINDA HARD TO GET OUT	4
PANELS SHOULD HAVE EASIER ACCESS LATCHES AND NOT MINIMARK FASTENERS. ATTACHMENT FITTINGS ARE TOO HIGH. IT MAY REQUIRE THE USE OF B-1 STAND.	4
Helo mode only a B-1 works	4
HARD TO REMOVE THE COTTER PIN FROM THE SUPPORT ASSEMBLY BOLT AND THE INBOARD LINK NUT ALSO HARD TO TORQUE THEM.	4
This aircraft was not designed for maintenance. The panel fasteners have to go, the inlet panels need improvement as far as installing.	4
NOT FUN TO DO, THERE SHOUD BE AN EASIER WAY	4
Because of the system, BFWS (S/S/S 6600) was in helo mode, (flight not ready mode) we could not bring the nacelles down to use to maintain them. Getting up to the heads proved rather difficult, and an odd assortment of equipment had to be used to do so.	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
as stated in question #3	4
A/C WAS IN BFWS. IT WAS HARD TO GET STAND UNDER NACELLE BECAUSE OF FUEL PROBE	4

S-9 Results

IT IS VERY HARD TO REMOVE AND INSTALL MINI MART FASTENERS ON PANEL 6LI3 BECAUSE OF THE CLEARANCE BETWEEN THE PANEL AND THE CONVERSION ACTUATOR. YOU HAVE TO REMOVE TO MANY CLAMP HOLDING WIRES BUNDLES TO GAIN ACCESS THEIR NEEDS TO BE MORE PLACES TO ATTACH SAFETY HARNESSSES IN THE WING TIP AND NACELLE AREA 4

Areas considered: Number/Type of fastners to remove to gain access to the system

Had to use a borescope. 4

Conversion actuator s/n hard to access. 4

THE FLOOR OF THE HANGAR IS VERY COLD NOT VERY MUCH CLEARANCE AROUND THE NLG AREA YOU HAVE TO LAY DOWN ON THE DECK AND SLIDE UP INTO THE NLG COMPARTMENT 4

Areas considered: Clearance around the system to perform maint
Cold weather equipment

NUMBER OF SYSTEM TO BE REMOVED 4

The antenna is at a hard to reach area of the rear sponson. For it to be CDI'd the inspector had to clinmb into the sponson with a flashlight. 4

SOME MINI MARKS WERE HARD TO GET TO 4

Safety wiring outside bolts was difficult 4

Areas considered: Clearance around the system to perform maint

The clearence for the generator is pretty tight. You do have room but if the ship shifted or moved due to rolling seas other components could be damaged. Due to the contact of the generator. 4

Areas considered: Clearance around the system to perform maint

when we first went to work, we did not have a stand available 4

Captive screws are very easy to break and lose. Access to different parts of the engine are sometimes difficult. 4

CLAMPS ARE IN THE WAY 4

Clearance around the bolt was minute 4

Areas considered: Clearance around the system to perform maint

Not enough clearance between the firewall and the cannon plugs 4

Areas considered: Clearance around the system to perform maint

THE CANNON PLUG IS IN A VERY TIGHT SPACE. ONE CAN JUST FIT INTO TAKE OFF THE SCREWS THAT HOLDS IT HERE 4

MLG trunnion attach points difficult to access: Tight working space inside MLG areas. 4

HAD TO REMOVE SOUNDPROOFING TO GET TO PORT 4

WAS ON THE BACK SIDE OF YOKE WHICH WAS HARD TO GET TO 4

NOT MUCH ROOM TO REMOVE AND REINSTALL THE CLAMPs AND LINEs ABOVE THE ENGINE 4

In flight ready position, the b-2 stand must be used. If two blades are to be accessed stand must be repositioned. 4

There were clamps that were hard to get at, maybe in the future the V-22 can have easier hardware to deal with 4

It took the cherry picker a long time to stup andget us in the right areasfto work, and we couldn't get close enough to the aircraft. 4

Areas considered: Number of panels to remove to gain access to the system
Number/Type of fastners to remove to gain access to the system

Not very much clearance around area. 4

Areas considered: Clearance around the system to perform maint

Cannot get to #7 midwing suppressor, also the lot numbers in the wing area are very difficult to read, due to how they are installed in the aircraft. 4

The pitot-static C/B is located behind a lot of other wiring and barely accessible with a ratchet and a 1/2 socket 4

Areas considered: Number of panels to remove to gain access to the system
Number/Type of fastners to remove to gain access to the system
Clearance around the system to perform maint

S-9 Results

The fact you have to use a stand to deservice a system is ludicrous.	4
wing cove area under sync shaft	4
Sliding the MFD in onto it's alignment pins can be tricky due to it's weight	4
This task is challenging because of the lack of clearance around the hardware, and the task is much harder in helo mode	4
Areas considered: Clearance around the system to perform maint	
The rope was not in the window part of the way	4
Z-brackets is not a good job to do with the head on the aircraft	4
Areas considered: Clearance around the system to perform maint	
To deservice one must be inside nacelle panel at reservoir/module. This makes it more difficult to access and more time consuming.	4
Spinner dome is very cumbersome to remove. (B-2, B-1) stand must be moved to gain access to fastners, in flight ready or maintainence positions.	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
Clearance around the MFD is minimal, and the unit was slightly difficult to put in because the guide pins on the mount were tight	4
Areas considered: Clearance around the system to perform maint	
There are too many wires around the component, and risk of damaging them is high	4
Areas considered: Clearance around the system to perform maint NBC equipment Cold weather equipment	
hard to get tools into manuving position	4
Maintenance is a lot easier when the rotor head is on the stand vice being on the bird in any position, resulting in less maintenance time.	4
Areas considered: Clearance around the system to perform maint	
Lot numbers VERY hard to read due to method used to mount into wing.	4
Had to use a borescope.	4
HAVING TO SAFTY WIRE THE CANNON PLUGS ON SOME OF THE SENSORS WAS DIFFICULT. SHOULD HAVE NON-SAFTY WIRE CANNON PLUGS	4
Have to keep moving maintenance stands around to gain access to blade fairings.	4
A lot of panels to remove to access one component (1 dome, 3 fairings)	4
we could see it but had to improvise to get it out and put it back in	4
Clearance was very limited. The panel which had to come off was very difficult.	4
Tryinbg to get the spinner dome holes to line up in order to get the screws in was a pain	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
0 panels I like that #	4
Areas considered: Number of panels to remove to gain access to the system	
did op check	4
the clearance around this item is challenging to work around	4
Very small opening in the twist capsule area	4
Areas considered: Clearance around the system to perform maint	
very confined area to work in	4
Areas considered: Clearance around the system to perform maint	
kind of hard put on screws when your arm is fold 3 different ways	4
there is not a lot of room to work in and around the nacelle	4
Areas considered: Clearance around the system to perform maint	

S-9 Results

In airplane mode this task in near impossible	4
Areas considered: Clearance around the system to perform maint	
A/C WAS IN BFWS. IT WAS HARD TO GET STAND UNDER NACELLE BECAUSE OF FUEL PROBE	4
I love tight spaces were the wrenches you need don't fit	4
Component was in the cell and hard to get to.	4
HAD TO REMOVE SOUNDPROOFING TO GET TO PORT	4
The plane being folded makes the replacement of this line easier. It lets you reach both sides of the tube. There is also a click stud that gets in the way of removing this tube.	4
To deservice one must be inside the nacelle at the module for systems 1 and 2. Access to the reservoir bleed is on the module. Access in cabin area would greatly reduce time of deservicing procedure. Also improving saftey of task, in addition would allow for ease to check level of HFLM by one maintaince personnel instead of two.	4
Had to remove wire clamps to gain space to install baffle	4
Large maintainance stand was difficult to position.	4
Hard area to get my hands into	4
Areas considered: Clearance around the system to perform maint	
the plane being folded also helped make the installation of the click studs and the line that it was connected to much easier.	4
Valve is on outside of module but we had to use a stand. Should be able to deservice inside A/C.	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
PANEL RIGHT BEHIND COUNTER BALANCE. YOU HAVE TO PUSH BALANCER OVER TO GET TO IT AND OFF & ON	4
best to work this in maintenance mode	4
Constantly moving maintenance stands to gain access to fasteners securing fairings.	4
sealant made it difficult to rmove screws from wia.	4
Not very much clearance.	4
Areas considered: Clearance around the system to perform maint	
Maintenance stand has to be moved at least twice to install our panel. This is due to location of fasteners securing panel.	4
l/h niu awkward to remove and replace	4
WAS ON THE BACK SIDE OF YOKE WHICH WAS HARD TO GET TO	4
Allot of panels to remove to access one compnent (1 dome, 3 bearings)	4
used ietms and nalcomis station	4
SERIAL #s HART TO FIND	4
wia 9 is behind abiu difficult to read j3 pins	4
frustrating to be moving b-2 stand around the a/c	4
We had to remove the intake to take an oil sample in helo mode. There should be an access panel to get to the drains on the PRGB.	4
Would have been easier to work on with blades unfolded	4
Areas considered: Clearance around the system to perform maint	
Would have been much easier with blades unfolded	4
in cockpit- sliding components in was the only difficult thing	4
Areas considered: Clearance around the system to perform maint	
The strap was hard to get to with the proper tools	4
Too small and tight of a work area	4
Areas considered: Clearance around the system to perform maint	
It's a pain to remove the two panels to get to it.	4

S-9 Results

Would have been easier to remove the CDD in airplane mode	4
VERY HARD TO GET TO COMPONENT, NEED MORE CLEARANCE	4
FOR INSIDE FLAP SEAL BOLTS NEEDED TO REMOVE FLAP ACTUATORS. VERY TIGHT SPACE. HARD TO GET TOOLS ON BOLT HEADS	4
Slipping is always unsatisfactory to access nacelle connectors. They are mounted at different length all over the nacelle clamped in terrible areas. Why couldn't these have been equal length plugs in one central easy access point?	4
Valve is on outside of module but we had to use a stand. Should be able to deservice inside A/C.	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
Removal of panel 6R13 requires a special shaved down, extra long allenwrench (with a long string attached) to remove the mini mark 4 fasteners.	4
Areas considered: Clearance around the system to perform maint	
difficult to safety wire	4
see question #2	4
Very tight areas to move and utilize tools to remove the PRGB. Constantly moving stands and ladders to gain access and perform maintenance.	4
had to drop engine to get to wires easier but engine was already out	4
Due to the conductive sealant on the antenna it took too long to take it out. The only way to take it off was to pry it off which could possibly cause damage to the copper mesh.	4
Camera mod was in the way.	4
WIRE HARNESS INTERFER WITH R & R	4
LIMITED SPACE TO GET TO ANTI-DRIVE HORN	4
YOU HAVE TO REMOVE THE INTERCOSTAL TO REMOVE THE ACTUATOR, THE HIGH LOCKS ARE HARD TO REMOVE WITHOUT MESSING THEM UP.	4
NO ROOM IN THAT AREA TO WORK IN. HAVE TO REMOVE ONE PANEL TO GET TO THIS PANEL	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
No Stands were tall enough to reach red blade while in maintenance position.	4
The access to work in fuel cell is too small making it very hard to work with two hands.	4
Areas considered: Clearance around the system to perform maint	
SERIAL # ON SOME COMPONENTS ARE VERY HARD TO CHECK	4
not much in the way of clearance	4
Areas considered: Clearance around the system to perform maint	
SHOULD BE ONLY 2 NEW NUTS (BUTS) WIRE HARNESSES INTERFER WITH THE REMOVAL & INSTALLATION OF THE PROCESSOR. YOU SOMETIMES HAVE TO TAKE SOME OF THEM OFF. TAKING 3X AS LONG TO DO THE MAINTENANCE TASK.	4
Areas considered: Number/Type of fasteners to remove to gain access to the system Clearance around the system to perform maint	
had to remove panels and cockpit door to assist in job	4
WINGNUT MUST BE STOWED TO ACCESS MIDWIND GAS GENERATOR #7	4
NEED AN EASIER WAY TO OPEN AND CLOSE AND SECURE WHILE OPEN THE PANELS FOR THE WASH NOZZLES	4
It was very difficult to line up the holes.	4
The fact you have to use a stand to deservice a system is ludicrous.	4
NOT A LOT OF CLEARANCE AROUND OR IN THE NACELLE	4
The water wash receptacles need to be lower.	4

S-9 Results

this task is difficult to perform	4
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
IF IN MAINT. MODE STAND IS NEEDED	4
IT'S A TIGHT FIX IN BETWEEN THE WING AND NACELLE	4
had to remove panels and to make job easier removed cabin door	4
NOT A LOT OF ROOM AROUND NACELLE TO INSTALL BAFFLE	4
Access is very time consuming.	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
not an extremely difficult task, but ietms makes it harder that it needs to be	4
Screws in this area usually strip very easy. Spinner cover is very unusual to work with, due to it's size. Also it usually doesn't go right on, it almost bonds where you take it off.	4
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system	
component should not be removed if you havent metered wires first. Component removal should be done if found bad or access to another area ie converter # 1	4
ietms does not call for the removal of any panels which is not the case	4
IF SERVICING BOTTOM LOW PRESSURE SCHRADER VALVE, YOUR FACE IS IN FRONT OF AIR VALVE	4
the wire harness ran behind a riveted panel and had an clamp back there. We had to run a string when the old one came out to pull the new harness through	4
no real problems	4
bus health monitor for env bus #2 is barred behind cv-2 below pdp 2 which is a lengthy access	5
the search light was easily accessible which made maintenace quick and efficent	5
no complaints	5
easy to get to	5
FLAP LEADING EDGE HARDWARE NEEDS TOBE BOLTS	5
The system needs to be loaded by a separate cable. IT ISN'T BAD OR TOO HARD, BUT IT SHOULD BE ABLE TO TO BE LOADED THROUGH THE REGULAR MLV PORT	5
wire harness doesn't have enough slack to install it properly something to consider in the future	5
all we had to do was run a pf bit and watch to see if the rudders move	5
system was easy to access but hard to insatll	5
Stand wouldn't reach	5
Areas considered: Clearance around the system to perform maint	
HAD TO MOVE STAND TO ACCESS AREA- TOP/SIDE FRONT	5
easy access	5
A/C IN HELO MODE	5
Not very much clearance.	5
Areas considered: Clearance around the system to perform maint	
Once the head was on the deck, made a big difference	5
Too many fasteners on the panel requiring removal	5
Areas considered: Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
REMOVED SWIVEL W/NACELLE HORIZONTAL. WAS MODERATELY TIGHT AREA CAN BE REMOVED IF TOP PANEL IS REMOVED. ACTUALLY IMPROVES ACCESIBILITY FOR REMOVAL/INSTALLATION.	5

S-9 Results

no complaints plenty of clearance	5
the bottom (when in helo mode) BACK BOLT IS IMPOSSIBLE TO GET OUT BECAUSE OF BOTTOM TERMINALS	5
although we have had several gripes on this sytem to make us as proficient as we are on generators	5
Was hard to get at the dogbone because of the wires	5
B-2 STAND WAS HARD TO MOVE WITH ONE PERSON	5
Not very much room around the nose area.	5
you have to be very flexible to get position take of this clamp	5
a/c has to bein stow position to get to number 7 gas generator	5
goes with the territory (A/C)	5
we should do away w/ retaining rings. They are a pain in the ass. They constantly come off and we usually spend more time looking for them than doing the job	5
HAD TO GET A WORKSTAND TO GET TO LOCATION OF DESERVICING PORT	5
ACTUATOR WAS A LITTLE HEAVY	5
IF NACELLES IN HORIZONTAL B-1 REQUIRED. IF NACELLES ARE IN VERTICAL POSITION 2 PERSONNEL ARE REQUIRED	5
IF NACELLES ARE HORIZONTAL THEN A B-1 STAND IS REQUIRED AND THERE IS NOT A PROBLEM. IF NACELLES ARE VERTICAL 2 PERSONS ARE REQUIRED AND PANEL IS TO HIGH TO REACH W/ B-1	5
HAD TO USE 90 DEGREE DRILL ADAPTER TO DRILL OUT HOLE	5
A/C WAS IN HELO MODE	5
TEMP ON THE HANGAR WAS TOO COLD	5
NEEDED A WORKSTAND	5
HAD TO USE A B-2 STAND WHICH IS TOO BIG AND BULKY	5
STAND HARD TO MOVE WITH ONE PERSON	5
HAD TO USE A B-2 WHICH IS TO BIG AND BULKY	5
B-2 STAND HARD TO USE	5
HAD TO USE A B-2 STAND WHICH IS TO BIG AND BULKY	5
IT WAS EASIER TO PULL THE LOWER DOOR OFF AND REPLACED THE LATCH IN THE SHOP	5
It is very hard to disconnect the 3 links supporting the engine, but can't really see how to make it easier, but it needs to be easier.	5
Not exactly easy maintenance, but it can be done when it has to be done.	5
WE HAD TO REMOVE FLOORBOARDS	5
Most tasks can be done with ease, but some are located in areas with little or no access, making them extremely difficult.	5
YOUR ARMS GET TIRED AFTER A WHILE, BUT ACCESSIBILITY IS GOOD	5
all in avionics bay	5
We had to remove the slip ring to get to the torque sensors, which is difficult	5
Areas considered: Number of panels to remove to gain access to the system Clearance around the system to perform maint	
Cockpit door presented a problem by getting in the way of area to be maintained	5
The componant was hard to get to, making the task much more lenghtly	5
STAND NEEDED	5
CLICKSTUD WAS IN A TIGHT SPOT ON ROTORHEAD. HARD TO GET TO	5
required removal of aircrafts life rafts	5

S-9 Results

TIGHT FIT	5
HAD TO REMOVE CONVERSION ACTUATOR PANEL. HARD TO GET TO MINI MARKS ON PANEL TO REMOVE AND INSTALL	5
mfd are easily accessed	5
tight area and hard to torque	5
it was fairly easy to get into panel and rubbing was in front	5
tight area and hard to torque	5
Too many panels to remove.	5
CLICKSTUD IN A TIGHT SPOT ON ROTORHEAD. HARD TO GET TO.	5
HAD TO REMOVE A LOT PANELS WITH A LOT OF SCREWS AND CLICK STUDS	5
YOU HAVE TO LAY DOWN ON THE FLOOR TO GET TO IT AND THE DECK WAS COLD	5
Areas considered: Clearance around the system to perform maint Cold weather equipment	
HAD TO SLIDE ON THE FLOOR, AND IT WAS COLD	5
HAD HARD TIME MANEUVERING HYD THROUGH HANGAR WITH ALL FOUR A/C UNSTOWED IN FLIGHT READY	5
HAD TO CRAWL ON HANGAR FLOOR TO GET THE TIRES. FLOOR WAS COLD	5
Too many clamp stack-ups easily cause FOD and assembly adds hours to this task because there is no reference on how to reinstall.	5
Areas considered: Number/Type of fastners to remove to gain access to the system	
Not very much clearance.	5
Areas considered: Clearance around the system to perform maint	
HAD TO USE A WORKSTAND TO GET TO LOCATION OF RESERVOIR	5
The front of the nacelle has to be taken apart which consumes a large amount of the time for this task. Even after everything is taken apart getting to the lower PRGB bolts is difficult and getting some of the air baffle bolts is very difficult.	5
wire bundle in front of the TDP makes it complicated to take it out as well as put it in,	5
Tight area	5
Areas considered: Clearance around the system to perform maint	
It is much easier to get to the top of the actuator if the head is off the plane, A/F should go first on a head install.	5
Panels that need to be removed cannot be removed in airplane mode.	5
Small area to work in, but the maintenance was not difficult to perform	5
Can be difficult depending on the position of the nacelles, it is much easier in airplane mode	5
Easy to access the area in the nose compartment	5
Overhead panel	5
Areas considered: Clearance around the system to perform maint	
Procedures were done in helo mode witch made it a little difficult to reach.	5
Had to get work stand to get up to nacelle to deservice hydro system.	5
Job was done in helo mode, this made the job a little more difficult to perform.	5
removing the fcc was relatively easy and functional check there was more than enough room	5
Hard to manuver for removal. Had to remove more panels than IETMs called out for.	5
The blades were folded horizontally, made if more difficult	5
NEEDED WORKSTAND TO GET TO LOCATION	5
Needed to use a work stand.	5
a lot of stands had to be moved around to remove fairings.	5

S-9 Results

For the actuator to be removed by sling threw top of nacelle the swashplate must be pulled out or disconnected.	5
Some of the panels are difficult to get to.	5
As per IETMs the nacelles horizontal, blades folded, one spinner panel is difficult to R2	5
Aft screws are really difficult to get to.	5
pretty tight area.	5
THIS TASK WAS REALLY EASY BECAUSE THE ROTORHEADS WERE OFF OF THE A/C	5
Had to get work stand to get up to the nacelle to deservice the hyd system.	5
Could not get to sample parts very well due to sound proofing.	5
GREASE FITTING CLOSEST TO ANTIDRIVE ARM RESTRICTS ACCESS TO VALVE WITHOUT 90 DEGREE ANGLED HIGH PRESSURE FITTING. ALSO THE PANEL TAKEN OFF DID NOT GIVE MUCH ROOM TO GET ACCESS TO THE CLOSEST VALVE ON THE INBOARD SIDE	5
GREASE FITTINGS ON INSIDE BOTTOM OF SWASHPLATES REQUIRES A 90 DEGREE GUN ADAPTER TO BE ABLE TO GREASE THEM	5
When the A/C is in pitch lock the PRGB dust cover is impossible to remove.	5
All we needed to do was T/S the system by ohming out some wires	5
When blades are folded, it makes it difficult to work on	5
Areas considered: Clearance around the system to perform maint	
if we had a stand to safely perform maintenance at this height, this system would be easy!	5
component was in midwing gear box very easy to get to	5
had to remove are large panel, but the clearance in the midwing compartment was good	5
number of other components to move	5
the accessibility is surpising good only one panel must be moved to get to the gen and perform maintenance	5
HAD TO PUT AIRCRAFT ON JACKS.	5
After removing the dampener hub, the CD is much easier to get to.	5
The only minor problem was sliding the new MFD into place.	5
some bolts are in tight hard to get to places	5
very little clearance	5
Allot of panels to get access	5
HAD TO REMOVE A LOT OF ITEMS IN ORDER TO BEGIN WORK. ENDS UP BEING A DAY JOB	5
HAD TO REMOVE A LOT OF COMPONENTS IN ORDER TO BEGIN WORK ON THE TASK	5
THE ELECTRONIC LOCKS AND SENSOR ARE IN THE WAY BUT THERE IS A WAY TO WORK AROUND	5
The nacelles should be in airplane mode to do this task	5
there are few panels to remove and same sound proofing to move but nothing extremley difficult to get around	5
A little hard to reach the top screws.	5
Work stand is required.	5
LOWERE AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS ONE IS IN FRONT OF AIRCHARGE VALVE LYING DOWN. POSSIBLE SAFETY VIOLATION TO HAVE FACE THERE IN FRONT OF COMPRESSED AIR	5
LOWER AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS YOU ARE IN FRONT TO VALVE LAYING DOWN. POSSIBLE SAFETY VIOLATION LAYING DOWN IN FRONT OF COMPRESSED NITROGEN, WHILE HOOKING UP HOSE AND CLOSING VALVE DEFLATING.	5
IT WAS ON THE BACK OF THE YOKE, WAS HARD TO WORK ON WHILE ON THE WORK STAND	5
Had to use workstand to get to blade fairing.	5

S-9 Results

The task was easier because the head was off the aircraft.	5
IN CABIN DESERVICING WOULD BE MUCH MORE CONVIENT	5
HAD TO REMOVE WIRE CLAMPS TO REMOVE BAFFLE	5
We had to tie the fairing up but the click stud was easily accessible.	5
Had a hard time lining up click stud with Z bracket. Could not use plastic applicator on clickstuds.	5
Areas considered: Clearance around the system to perform maint	
HAD TO USE WORKSTAND TO GET TO TASK	5
Needed a workstand to get to location, had trouble reaching the top mini-mart on fairing from workstand.	5
Needed a stand to get to nacelle. In cabin deservicing would be outstanding.	5
Needed a ladder and a workstand.	5
THIS JOB WAS EASILY ACCESSIBLE NO PROBLEMS	5
BAFFLE IS LOCATED IN RIGHT NACELLE ON CROSSMEMBER. KIND OF TIGHT FIT TO INSTALL BAFFLE AS WIRE BUNDLES AS ARE PRESENT BUT NOT EXTREMELY DIFFICULT	5
HAD TO REMOVE SOUNDPROOFING. QUICK DISCONNECTS BE MORE SUITABLE FOR TASK AND WOULD MAKE TASK EASIER.	5
ONLY HAD TO REMOVE UPPER CREW DOOR FROM A/C TO GAIN ACCESS	5
ONLY HAD TO REMOVE TWO PANELS FROM THE DOOR TO GAIN ACCESS TO THE WINDOW PIN. ALSO HAD TO REMOVE SOUND PROOFING FROM DOOR	5
Needed stand to complete task, it was hard to move around. In cabin deservicing would be outstanding.	5
ACTUATOR IS FASTENED BY FOUR NUTS AND BOLTS. TO ACCESS THE NUTS REQUIRES A FLOOR BOARD TO BE REMOVED. TASK WOULD BE FAST AND EASY IF THE BOLTS HAD NUTPLATES.	5
We had to remove a click stud to get the line out.	5
HAD TO WORK AROUND SEAT	5
NEEDED WORKSTAND TO REACH AND A LADDER TO GET TO IT FROM UNDERNETH	5
SAFETY CONCERN - MARINES ON TOP OF NACELLE	5
HAD TO PUT AIRCRAFT ON JACKS	5
Job was done in helo mode, this made the job a little more difficult to perform.	5
HARD TO REMOVE SOUNDPROOFING TO GET TO	5
Little tight installing nut cage	5
Requires a stand.	5
Had to use stand	5
Line connection to reservoir is in a tight place. Line to heat exchanger is only hard to reach and maintain. The stand cannot get that close to the nacelle with the maintenance door opened.	5
NO SPECIFIC TQ ON RETAINER BOLT	5
Akward position	5
CAN BE HARD TO GET TO WHEN A/C IS IN VERTICAL POSITION	5
BATTERY WAS A LITTLE HEAVY AND IS INSTALLED OVERHEAD IN CABIN	5
HAD TO REMOVE SOUNDPROOFING TO GET TO PORT	5
SOUNDPROOFING HAD TO BE REMOVED TO DO THE JOB	5
LOWERE AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS ONE IS IN FRONT OF AIRCHARGE VALVE LYING DOWN. POSSIBLE SAFETY VIOLATION TO HAVE FACE THERE IN FRONT OF COMPRESSED AIR	5

S-9 Results

LOWER AIR CHARGE VALVE ON BOTTOM OF STRUT TO ACCESS YOU ARE IN FRONT TO VALVE LAYING DOWN. POSSIBLE SAFETY VIOLATION LAYING DOWN IN FRONT OF COMPRESSED NITROGEN, WHILE HOOKING UP HOSE AND CLOSING VALVE DEFLATING.	5
IT WAS ON THE BACK OF THE YOKE, WAS HARD TO WORK ON WHILE ON THE WORK STAND	5
NEEDED WORKSTAND TO GET TO LOCATION	5
tight area	5
SOME PANELS NEED WORK STANDS TO REACH	5
Ladder/stand needed to perform task, which takes up more time.	5
SMALL AREA TO WORK IN	5
NEEDED LADDER TO REACH.	5
HAD TO PUT AIRCRAFT ON JACKS.	5
Had to remove a panel on L/H green blade, was at the top of inverted Y	5
have to actually remove & replace programmer for this task	5
Areas considered: Clearance around the system to perform maint	
it would be easier to install if it was on a mount with lock studs to secure it.	5
Areas considered: Clearance around the system to perform maint	
HAD TO REMOVE SOUNDPROOFING TO GET TO PORT	5
small area to work around near pdp 3	5
Quick disconnect fittings should be installed for quicker connections from HSU to aircraft. It would be a lot messier also.	5
SOME MMIV FASTNERS ARE BEHIND CONVERSION ACTUATOR	5
NEEDED A WORKSTAND	5
requires a technicians to crawl under aircraft to re-hang weights several times	5
tight area	5
HAD TO WORK AROUND SEAT	5
NEEDED WORKSTAND TO REACH AND A LADDER TO GET TO IT FROM UNDERNETH	5
SAFETY CONCERN - MARINES ON TOP OF NACELLE	5
HAD TO PUT AIRCRAFT ON JACKS	5
BATTERY IS QUITE HEAVY TO CARRY AND INSTALL IN THE OVERHEAD PORTION OF THE CABIN, AND CLAMPS ARE IN THE WAY OF PUTTING IT IN EASILY	5
Areas considered: Clearance around the system to perform maint	
IT WAS KIND OF TIGHT GETTING A WRENCH AROUND THE LAST TWO NUTS	5
PILOTS SEAT MAKES IT INCONVIENCE AND TIME CONSUMING	5
Areas considered: Number of panels to remove to gain access to the system Number/Type of fastners to remove to gain access to the system Clearance around the system to perform maint	
THIS COMPONENT WILL BE EXTREMELY DIFFICULT TO CHANGE OUT UNDER EXTREME WEATHER CONDITIONS, WITH HEAVY GLOVES, OR WHILE WEARING NBC GEAR	5
WIRE BUNDLES IN THE WAY TO THE LEFT AND RIGHT	5
ONE CLAMP BESIDES THE BATTERY GETS IN THE WAY WHEN INSTALLING	5
Areas considered: Clearance around the system to perform maint	
EVERYTHING WAS FAIRLY EASY TO GET TO EXCEPT FOT CV-1 WHICH HAD TO TAKE OUT KY-58'S AND THE MOUNTS THEN TAKE OUT A PANEL THEN ALL THE CONNECTORS (X2) WAS ON THE SIDE PLUS TWO NUTS TERMINALS	5
IT IS HARD TO SAFETY WIRE THE SEAT MOUNTING BOLTS.	5

S-9 Results

DIFFICULT BUT POSSIBLE TO READ C/P'S FOR T/SING	5
WORKSTAND REQUIRED . FRONT OF STAND MUST BE REMOVED TO ACCOMMODATE FOR LARGE SIZE OF PANEL AND ACCESSIBILITY OF TWO MAINT. PERSONNEL.	5
Task included serialization- conversion actuator assembly serial number; quite difficult to find and access	5
NEEDED WORK STAND	5
WIRE CLAMP IS IN THE WAY ON NEIGHBORING WIREBUNDLE WHEN REMOVING OR REPLACING	5
Areas considered: Clearance around the system to perform maint	
CAN BE HARD TO GET TO WHEN A/C IS IN VERTICAL POSITION	5
This actuator was fairly easy to access. The clearance around the actuator was tight but not impossible.	5
Areas considered: Clearance around the system to perform maint	
ONE OF THE CLICKSTUDSWAS HARD TO GET FROM THE BACK HAD TO USE SAFETYWIRE TO PULL IT UP FROM THE TOP. MAYBE THAT SHOULD BE ADDED TO IETMS	5
Had to convert to a/p mode and the back to helo mode, rotate the hub and then convert back down to a/p mode.	5
WORK STAND REQ'D. FRONT OF STAND MUST BE REMOVED (SAFETY RAIL) TO ACCOMMODATE LARGE SIZE OF PANEL AND THE ACCESIBILITY OF TWO MAINT. PERSONNEL.	5
WATER WASH HOOK UPS MORE ACCESSIBLE, LIKE NEAR GROUND LEVEL	5
slightly difficult to get to	5
Was fairly easy with the rotor head off	5
On top of aircraft by rudders	5
had to remove sealant fairing assembly to perform maintenance	5
the rotor head is very tight to insp w/the spinner dome and panels on	5
Had to use stand	5
Access to the yoke is very limited.	5
HAD TO REMOVE A CONNOR PLUG TO GET TO SURFACE WHERE CLICKSTUD WAS PLACED	5
IS LOCATED BEHIND SOUNDPROOFING	5
HARD TO INSP AROUND TOP PORTION OF ENGINE	5
WOULD BE EASIER IN HELO MODE	5
WATER WASH RECEPTECAL'S SHOULD BE LOCATED UNDERNEATH THE WING TO MAKE IT EASIER	5
HARD TO REMOVE SOUNDPROOFING TO GET TO	5
Pilot's need not to push down on indicator lights so hard as to not break them, and the bulbs can be changed with minimal effort.	5
Easier with the head on the stand	5
Tight in some places places under floor boards.	5
Floor boards had to be pulled to insp. Area under them.	5
Areas considered: Clearance around the system to perform maint	
The central de-ice distributor is removed easier when the aircraft is in airplane mode	5
RETAINER BOLT VERY WEAK. NEED A SPECIFIC TORQUE	5
IN CABIN DESERVICING WOULD BE MUCH MORE CONVIENT	5
We had to tie the fairing up but the click stud was easily accessible.	5
HAD TO CRAWL UNDERNETH AIRCRAFT TO GET TO LANDING GEAR DOORS	5
PULLING LARGE PANELS IN WIND IS AN ACCIDENT WAITING TO HAPPEN PANEL COMING OUT OF HAND AND DROPPING	5
Little tight installing nut cage	5

S-9 Results

Requires a stand.	5
This actuator was fairly easy to access. The clearance around the actuator was tight but not impossible.	5
Areas considered: Clearance around the system to perform maint	
NOT TO HARD TO GET TO BUT A LOT OF LITTLE WIRE CLAMPS HERE AND THERE THAT TAKE UP EXTRA TIME	5
Line connection to reservoir is in a tight place. Line to heat exchanger is only hard to reach and maintain. The stand cannot get that close to the nacelle with the maintenance door opened.	5
We had to remove a click stud to get the line out.	5
RETAINER BOLT VERY WEAK AND COULD BREAK EASILY	5
Akward position	5
THE CRAMPED COCKPIT MADE IT DIFFICULT TO GET SOME PARTS	5
NEEDED A WORKSTAND	5
the rotor head is very tight to insp. W/the panels on	5
NO SPECIFIC TQ ON RETAINER BOLT	5
WASH RECEPTECALs SHOULD BE INUNDER THE WINGS	5
it was hard to get to some of the safety wire on the main seat bolts on both seats.	5
WE TOOK IT OFF AND BROUGHT IT IN THE SHOP	6
TOP OF WING	6
IT WAS ON THE HEAD WHICH WAS OFF THE A/C AND ON A STAND AT THE TIME	6
HEAD WAS ON STAND	6
the component was easily accessible	6
IN VERT. POSITION PANEL WAS ACCESSIBLE. DID NOT SEAL PANEL WITH NACELLES IN HORZ. POSITION AS CALLED OUT IN IETMS	6
HAD TO USE WORKSTAND TO GET TO A/C	6
Baffle located in L/H nacelle	6
easy panel to open with quick fastners can be performed easily in airplane or helicopter modes	6
REMOVED 1 PANEL	6
ROTORHEAD WAS ON A STAND WITH EASY ACCESS	6
DOOR WAS IN SHOP	6
I leak checked line and retorqued it in the fold/stowed position. It could be reached from the top and bottom of the midwing.	6
TOOK 1 PANEL OFF ON DOOR	6
Getting in/out of cockpit, working with CDU/MFD's	6
There is only one panel to remove, and computer is easy to replace	6
CLIMBED ON TOP OF A/C WIPED OFF WITH RAG AND GLASS CLEANER	6
needs to be mentioned in ietms when removing bateries for inspection(specify exactly that they need to be removed one at a time like ietms says but there needs to be atleast one battery in at all times so the gps reciever does not lose its codes	6
this task is easy to perform	6
RELATIVE TO TASK AT HAND	6
there was plenty of room around the component so that the removal and installation was fairly easy	6
Areas considered: Clearance around the system to perform maint	
TOOK DOOR OFF AND BROUGHT TO SHOP	6
PROPROTOR AREA, SPINNER/DOME PANELS EASILY ACCESIBLE	6

S-9 Results

Very easy to get to area to work be worked on

6

Areas considered: Clearance around the system to perform maint
