AVIATION WEEK NETWORK 2020 Program Excellence Awards

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Thank you for participating,

Gregory Hamilton
President
Aviation Week Network

Acknowledged, agreed, and submitted by

_____ 29-June-2020
Nominee's Signature Date

Nominee's Name (please print**):** John F. Murphy

Title (please print): Director Sustainment & Support ASolutions

Company (please print): Elbit Systems of Amercia Inc.

NOMINATION FORM

Name of Program: *F-35 Helmet Mounted Display Performance Based Logistics (DMCH)*

Name of Program Leader:

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☐ *Customer Approved*

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☐ *Supplier Approved (if named in this nomination form)*

- *Date:* _____
- *Contact (name/title/organization/phone):* _____

CATEGORY ENTERED

Refer to definitions in the document "2020 Program Excellence Directions." You must choose one category that most accurately reflects the work described in this application. ***The Evaluation Team reserves the right to move this program to a different category if your program better fits a different category.***
Check one

- ☐ *Special Projects*
- ☐ *OEM/Prime Contractor Systems Design and Development*
- ☐ *OEM/Prime Contractor Production*
- ☐ *OEM/Prime Contractor Sustainment*
- ☐ *Supplier System Design and Development*
- ☐ *Supplier System Production*
- ☒ *Supplier System Sustainment*

Point Distribution

Executive Summary: Make the Case for Excellence (15 pts)		
Metrics **10 pts** Predictive Metrics (10)	**Program Volatility/ Uncertainty/Complexity/ Ambiguity** **25 pts** Describe overall VUCA (10) Cite examples of team response (15)	**Organizational Best Practices & Team Leadership** **40 pts** Innovative Tools and Systems (15) Unique Innovative Processes for People Development/Knowledge Transfer (15) Unique Practice es for Customer Engagement (10)
Value Creation (10 pts)		

Abstract

In 150 words or less, why is this program excellent in terms of execution?

For almost three years, there have been zero instances of Mission Impaired Capability Awaiting Parts (MICAP) related to any portion of the Helmet Mounted Display System (HMDS). Operational Availability (Ao), is the ability to successfully launch and accomplish the mission. Ao is the utmost indicator of a platform's worth to the Armed Forces. The F-35 aircraft is the premier USAF program for the 21st century. It delivers all-weather, day and night combat firepower in support of combat operations around the world. The HMDS is the man-machine interface between the pilot and the weapon system. If the HMDS cannot perform its duties, the aircraft will be unable to launch and be considered MICAP. Lockheed Martin (LM) and the USAF rely on the Sustainment and Support Solution (S&SS) business unit at Elbit Systems of America (ESA) to keep this critical aircraft system in the fight 24/7

Figure 1: The HMDS delivers an unparalled ability to meet mission requirements 24/7, and the HMDS PBL ensures it is there every time it is called upon.

Purpose

Provide a 150-word description of the purpose of this program, spelling out all acronyms and correct acronyms

The purpose of F-35 HMDS Performance Based Logistics (PBL) produces increased Aircraft Availability (Ao) while reducing sustainment costs by redirecting focus to the flight line and away from the repair process through advanced planning and collaboration with LM.

Figure 2: The purpose of the F-35 HMDS PBL program is to support the aircraft while minimizing cost and maintaining high levels of availability.

A 'typical' Return and Repair process (figure 2), is very transactional and is comprised of a series of sequential tasks resulting in longer turn-around times (TAT) and reduced readiness.

Our PBL Repair operation (figure 5) is three independent, but supporting repair cycles supported with the required materials to ensure a 100% fill rate on the shelf for repair parts, that goal was achieved, resulting in there has not been a F-35 mission aborted related to a HMDS component failure in almost 4 years.

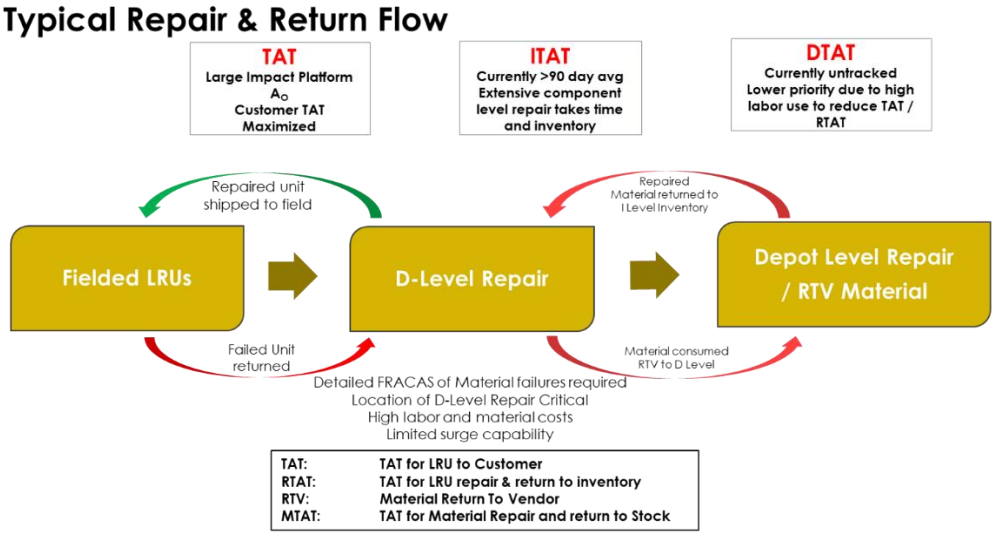

Figure 3: A typical repair work flow is very transactional and focuses on a series of sequential tasks resulting in longer TAT and reduced readiness

Executive Summary: Make the Case for Excellence *(Value: 15 pts)*

What is the vision for this program/project? What unique characteristics and properties qualify this program for consideration?

The Elbit team envisioned success for this program before they even started planning. Typical repair operations are rated on turn-around times (TAT), but that is only part of the story. TAT is usually measured dock-to-dock and ignores are the other contributors that cause the customer pain. Getting the failed unit replaced with a functional one and returning it to the Depot for Intermediate level repair has to be monitored, measured and controlled. On the other end of the repair operation getting the unit from our dock back to the user unit and on the supply room shelf ready for issue is the only thing that stops the customer's pain. The LM-ESA team planned for this. Besides communicating constantly electronically, the team planned weekly face-to-face meetings to review every item in the pipeline. Steps are taken to correct delays. This is critical with the different variations of the F-35 Fighter. Different software is running on each variation resulting in 3 different HDMS computers. It is not as simple as having an item fixed and on the shelf. It has to be the right variation for that platform. Some aviation units have multiple variations of the jet on their flight line, so the right unit at the right time and location is critical.

The collaboration and focus of the LM-ESA team made this happen time and time again. This process focuses on the mission and strives, along with the LM team to deliver a PBL response that achieve even more than any other PBL by focusing on mission accomplishment, rather than typical turnaround times. The best product built by a supplier means nothing if they are sitting on a shelf broken awaiting repair actions. PBL contracts, typically are designed with the goal to improve logistical support beyond what is generally achieved via a traditional support contract. This is viewed as a means to that end; reducing costs by incentivizing the sustainment contractor to improve the product as they go along. However, it does not work to reduce the immediate problems of poor support. The intended result of the collaboration between ESA and LM was to design a process that supported ***the goal of improved readiness while still reducing costs*****.** Being able to improve warfighter readiness and effectiveness through better weapon system availability and reliability, at lower cost was a lofty goal, but we were able to attain it. Shifting responsibilities to the Contactor with accompanying incentives is a start, but it is the actual framework by which execution is managed that is the discriminator between throwing money at a problem and designing and implementing a solution focused on improving Ao. The LM-ESA Sustainment team needed extremely high levels of collaboration to achieve their goal and they deliver in spades.

Figure 4: The HMDS is the Machine Interface for the F-35 Joint Strike Fighter.

In search of this level of collaboration and focus, ESA approached LM with a SOW tailored to their objectives as opposed to the transactional details. LM was already comfortable working closely with the Elbit Sustainment team, a relationship that was producing better outcomes day by day. However, these outcomes came at a cost, which was transactional bureaucracy and paperwork that can ground the process to a very slow pace. Certainly, the HMDS PBL uses effective contracting to minimize cost to LM and ESA while ensuring product is on wing where it belongs. The LM-ESA F-35 Sustainment team's weekly meetings examined every item in the system and any obstacles to progress towards repair. Purchase orders are issued to track activity, but the process is authorized in full by the master contract and funded by a monthly fee to cover Elbit's costs. Just as certain, the PBL is metric driven to ensure focus is placed on the right issues at the right time. But what is unique to the F-35 HMDS PBL and its success is the collaboration and level of details shared between ESA and LM which has created a strong team. **A strong team focused on the main program objective of F-35 A_o.** Rather than simply focusing on Turn Around Times (TAT), which is transactional in nature, Elbit focuses on average age. The average age a unit is down is a key indicator to the effectiveness of the repair operation. Even when adequate spares are available, a situation not often enjoyed early in the F-35 program, the pain starts when the unit fails and does not stop until it is returned to the supply room shelf, where it can rise to meet the next demand in sequence.

Elbit challenged the paradigm that improved readiness is a costly solution and met their goal of improved readiness while still reducing costs

This is where our unique operation; **Elbit's Integrated Optimized Repair (IOR) Flow** comes into play. PBL Metrics can be achieved by front loading the system with spare parts, but this is costly from the start and increasingly so when product improvements or changes roll out during production. By separating the various maintenance tasks into independent but supportive cycles, the IOR approach focuses on Mission Accomplishment, not simply on transactional turn-around times. Additionally, the IOR, highlighted in the figure below, reduces the amount of spares the customer needs to support field readiness. Here is how this is being accomplished; by returning a failed unit to an Inventory Control Point (ICP), located at

LM's logistics supply contractor, where an immediate replacement LRU is issued and sent to the requesting unit.

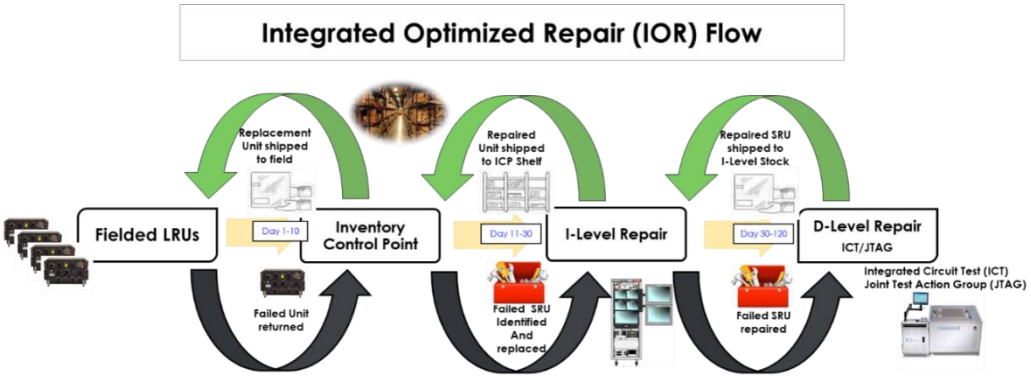

Figure 5: Elbit's IOR Repair Flow separates the different levels of repair to allow the focus to be placed on Ao with fast turnaround of repaired units to the field.

This approach leans forward with units ready to restock the aviation unit's stock room shelf at an Op-tempo that ensures the supply shelf never goes bare, even though PBL metrics would allow for some time in order fill. This ensures aircraft readiness, while lowering platform sustainment costs for the USG. The failed unit is turned over to the Intermediate Level maintenance, which is located at Elbit's Fort Worth facility. This is where teardown, testing and evaluation (TT&E) occurs to determine which component inside the unit failed. The failed component is replaced utilizing parts already on hand and the unit is returned to the ICP for future use. This quick turnaround reduces the amount of time the unit spends in the repair cycle, further reducing costs via the number of sustainment spares required.

Focused scrutiny of all units in the shipping pipeline coupled with repair materials moved forward into an independent Intermediate repair cycle produced improved readiness while reducing sustainment costs

Failed components are transported to the D-Level facility, also located with the Elbit Fort Worth plant, for detailed component failure analysis and repair. Elbit employs a failure reporting, analysis, and corrective action system (FRACAS), using software, that provides a process for reporting, classifying, analyzing failures, and planning corrective actions in response to those failures. We use it to manage multiple failure reports and produces a history of failure and corrective actions. FRACAS records the problems related to a product or process and their associated root causes and failure analyses to assist in identifying and implementing corrective actions. Collecting this information through all levels of maintenance and utilizing the software spine to link it all back to the original failure provides critical information for designers, logisticians and users.

Once the failed component is repaired, it is shipped back to the I-Level repair facility stock room for use in future repairs. Once optimized using FRACAS data, component levels can be adjusted and maintained to ensure timely turnaround of components, while reducing inventory levels to as required. This reduces the need for additional spare units for the customer and the contractor. Each portion of the IOR can be optimized to support the specific goals of that level.

Tremendous benefits materialized from locating the I & D level repairs at our factory in Fort Worth;

1- Allows immediate access to experienced repair technicians and that knowledge base
2- Facilitates extensive component level troubleshooting & repair without direct impact on TAT
3- Results in Zero units categorized as Beyond Economic Repair (BER) from program inception to date saving the customer money in buying additional spares
4- Reduces Test Equipment bottlenecks by creating an alternate path for Printed Wiring Assembly (PWA) troubleshooting/repairs through ICT (not for environmental failures)
5- Ensures TAT Compliance is maintained while maximizing surge capability for periods of increased OPTEMPO

VALUE CREATION *(Value: 10 pts)*

Please respond to the following prompt:

- ***Clearly define the value of this program/project for the corporation beyond profit and revenue***

The F-35 HMDS PBL has tremendous value to Elbit beyond profit and revenue. ESA lives by the motto, "We provide Innovative Solutions That Protect and Save Lives." Our Sustainment group actualizes this ethos in the motto, "We keep the solution in the fight 24/7." The best solution from the factory floor is useless if it is tied up in the repair cycle. Elbit prides its reputation as a supporter of Armed Forces, and the F-35 HMDS PBL goes the distance in cementing that reputation. If the motto is the talk, our HMDS PBL is the walk. The HMDS once suffered from the notorious reputation of residing on the F-35 Top 10 Systems Degrader list. A top 10 ranking no one enjoyed. Numerous man-hours and management attention were paid to dealing with the repair operations struggling to keep up with the volume supporting a system that did not have adequate spares in the field for support. Designing the PBL effort from the ground up allowed Elbit to get off that infamous list and has enjoyed a track record with no Aircraft on Ground (AOG), otherwise known as MICAP related to the HMDS in 4 years. The Elbit JSF Sustainment team (Program management, Operations, Contracts and Sustaining Engineering) hold their heads with pride knowing they not only turned a terrible situation around, but produced a benchmark, best practice program support the DOD's top weapon system.

Figure 6: The F-35 is a mission critical asset to our Armed Forces and the HMDS is a critical component of the aircraft systems that allows it to perform at such a high level.

Elbit's benefitted from cost reduction in the paperwork churn for both the program management office and the contracts personnel. The PBL allows a faster work flow to move the product through the repair facility. In a typical repair contract, there are many hours expended once a failure is identified generating quotes, getting the proper approvals prior to proceeding with the repair, Return of Material Authorization (RMA) and shipping. This process requires that the repair of the unit be placed on hold pending the customer approval to proceed with the completion of the repair. Under the PBL contract, an incoming repair flows smoothly through the repair process without facing delays waiting on proper approvals. The reduction of effort expended drastically reduces indirect costs that drive overheads at Elbit Systems of America and Lockheed Martin.

One of the biggest issues the HMDS program faced under previous types of contracting efforts was constraints that limited the stocking levels of lay-in materials to support repairs. Due to the lack of materials to support a quick turn, the team faced multiple MICAP conditions in a single month. Under PBL, the materials, test equipment and repairs are funded monthly based on performance to metric driven requirements. Elbit manages all the decisions in these areas. If a change is required, Elbit simply implements it. The metric driven funding allows LM to focus on managing performance outcomes and not get down into the details of the day-to-day management of individual repairs. The PBL puts the onus on ESA to ensure metrics are being met and allows the flexibility to procure the right materials at the right time. The effectiveness of the changes to the program has allowed us to meet the goal of aircraft availability and is demonstrated in not having a single MICAP since inception.

- ***Clearly define the value of this program/project to your customer***

The DOD, LM and the US Taxpayer benefit from the cost savings in this program. The cost of a grounded aircraft is so far-reaching it can be almost impossible to calculate. Trained flight crews unable

to fly, ground support personnel waiting on a late or delayed flights. All these costs flow out to our defense budgets and ultimately the taxpayers. In addition, LM and the USAF benefit with lower overall costs for repairs to pass along to the USAF. This is critical while both LM and the Joint Program Office (JPO) work endlessly to promote the JSF around the world, other nations are concerned about the sustainment costs as well as the purchase price of the platform. The HMDS PBL provides metered sustainment costs easily tied to OPTEMPO. Customers not fear disproportionate swings in their operating costs as flight operations surge. PBL costs are planned to support a wide range of OPTEMPOs and incentivize Elbit to keep those costs controlled, but at the cost of A_o. Anyone could control costs simply by controlling and limiting the resources available, regardless of the need. But the Elbit HMDS PBL utilizes our IOR Repair flow to move resources forward to support flight operations. Using Logistic Analytics and real-world usage data, Elbit can predict failure rates with great accuracy. This allows the accurate forecasting, ordering and placing of repair components to reduce repair times. Placed into the Elbit IOR flow and you are able to deliver repeatable results with less inventory, less spares and reduced costs all around. These savings make the JSF competitive in other nations reducing the costs of the US Taxpayers investment in this technology.

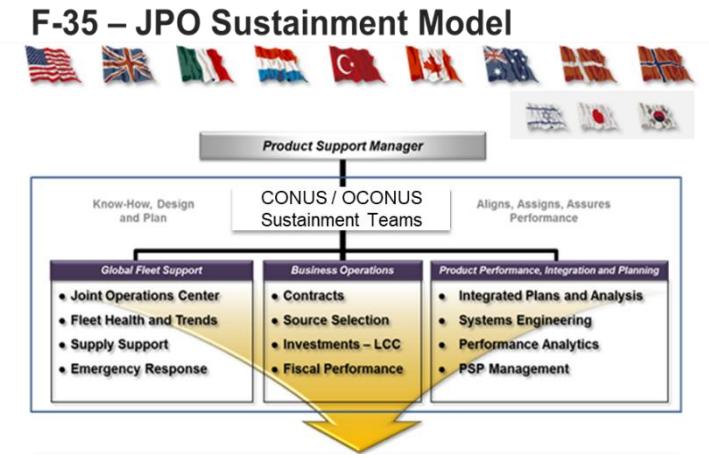

Figure 7: LM and JPO efforts to promote the JSF around the world are supported by HMDS performancee and low sustainment costs

Further, the reduction in Purchase Order churn allows for limited Contract personnel resources to lift their heads and look to the horizon providing better planning and results for the next component repair effort. The result is the proper mix of materials are immediately and always available and we reached the goal of improved A_o and zero MICAP aircraft for over three years related to any HMDS component.

➢ *Clearly define the value of this program/project to members of your team*

The Elbit JSF Sustainment team is part of a larger group of sustainment professionals working all things related to our fixed wing business lines, as shown below. The team has benefited in experience and stature as they stood up a response to a customer requirement that they designed from the ground up; collaborating with our subcontractors and LM to closely examine procedures and cost drivers before the RFP was issued, to allow for a tight, compliant proposal response that has been used as a model by LM for other efforts.

Figure 8: the HDMS PBL is managed as part of the larger Fixed Wing Products portfolio

Elbit employs several methods to nurture and train our up and coming professionals; mentoring, employee goal setting and counseling sessions, tying the employees' goals, metrics and results to the larger department and company mission. People who see the value in their work and get positive feedback have better self-esteem and are better employees and more easily retained for future growth in the organization.

Figure 9: Challenging and Highly Important programs, such as the HMDS PBL provide a vehicle whereby employees benefit in growth in self-esteem and becoming better employees, who stay with the organization longer.

Elbit's F-35 Sustainment program, including the HMDS PBL, is an excellent training program opportunity by which our employees can gain invaluable career experience, and even the notoriety that comes with mission success and a job well done. This program has it all; planning, financial objectives and reporting, collaborating with teammates and customers, short term instant reactions required for daily challenges and long term analysis and planning for sustained successes. Such an environment is invaluable to Elbit as a platform to train and mature our future leaders. There is no seminar, mentoring program or certification process that produces better results than the **act of performing** on such a multi-faceted program as the HMDS PBL.

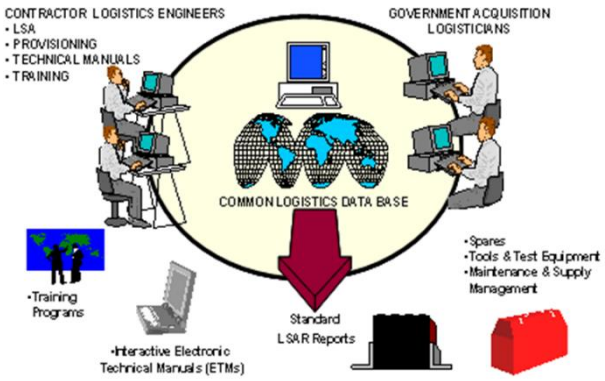

Figure 10: Working on an important, hi-vis program, such as the F-35 HMDS PBL produces invaluable experience and job satisfaction to Elbit's employees.

➢ *Clearly define the contribution of this program/project to the greater good (society, security, etc.)*

The F-35 JSF Program is cutting edge and therefore, as could be expected, quite expensive. It has always been under close scrutiny of Congress and the Press. It has also been scrutinized for what some may consider less than optimal mission readiness numbers.

Historically, the normal Life Cycle Cost Distribution of DOD weapon systems procurement is outweighed by the long term life cycle sustainment costs. The F-35 HMDS PBL is doing an excellent job in contributing to reversing these impressions with quantifiable and verifiable results. Creating a new normal in this paradigm. The defense of our nation and our liberties is a 24/7, all weather job and the men and women that perform that defense are the best of our best. The F-35 HMDS PBL ensures the effectiveness and affordability of an excellent solution that protects the lives of those men and women, while delivering operational results. Delivering on a promise, a commitment, a mission is a goal many aspire to, but when people with a common purpose come together to deliver exceptional results, it is a wonderful thing to admire. Delivering results for our customer, LM, our nation and its Armed Forces, and for our company and co-workers is a noble pursuit.

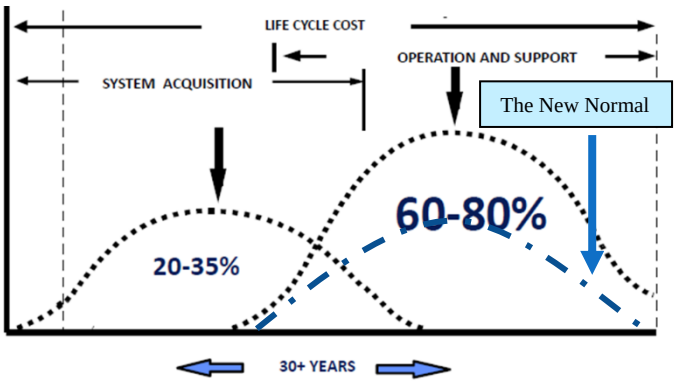

Figure 11: Elbit's efforts work to create a new normal, where Normal Life Cycle Cost Distributions are leveled or even reversed sustainment costs no longer need to be the costly "tail wagging the dog."

***METRICS** (Value: 10 pts)*

Please respond to the following prompt:

- ***How do your predictive metrics drive action toward program excellence?***

Elbit has electronic live visibility into LM stock levels. The metrics for the F35 Helmet Mounted Display System (HMDS) Performance Based Logistics (PBL) contract are updated in real time, allowing the IPT team to review and discuss trends that are seen on the repair line and adjust accordingly. Prior to the HMDS PBL contract, Elbit would wait for a failure to be reported, a Return Material Authorization (RMA) to be issued and the failed item returned to our facility before any reaction steps could begin. Now, in the HMDS PBL, Elbit has electronic visibility into LM stock levels. If the LM supply systems issues a replacement unit to the field, Elbit knows it immediately and ships a replacement unit to the LM stockroom shelf.

Elbit has the ability to see in real time changes in actual flight hours in the field. Prior to the PBL contract, the failure analysis was calculated based on assumed operating tempos, not actuals. Through collaboration with Lockheed (LM), Elbit Systems of America (ESA) is able to view the actual flight hours in real time and bounce those numbers against the failures on the repair line. This real time data is key in keeping the forecasted failures data up to date and to predict the need for lay-in spares to support a quick repair turn time going forward. The unique metrics calculated for PBL execution are not static snapshots of data, but are instead metrics allow us to see where we have been, current status and provide a calculation for future performance. The team tracks 2 years of past performance and projects 3 years of future performance to give the program office a living view of the health of the program in an easily digestible metric that drives action.

The HMDS PBL uses Fill rate metrics to measure the effectiveness of its efforts. If LM looks to the supply room shelf for a replacement and it is not there, we have 7 days to deliver the part. Our fill rate can be as low as 94% and our metric would be fully met. However, Elbit monitors inventory levels as detailed above and has maintained a **100% fill rate throughout the program**. This is what produces the key measurement of success, which is that there has not been an F-35 in a MICAP condition in almost 3 years.

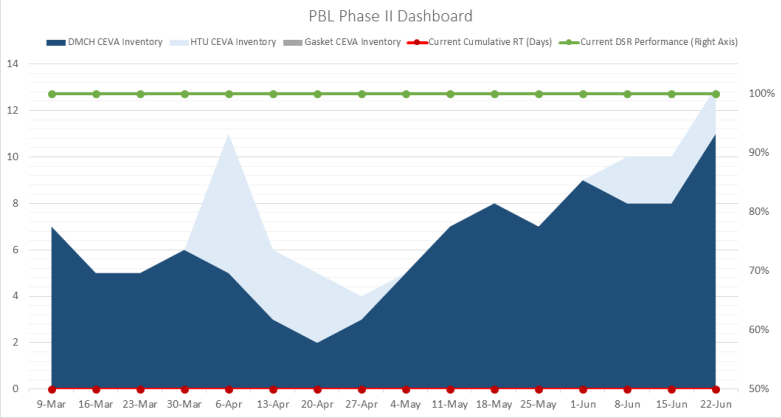

Figure 12: Elbit has maintained a 100% fill rate for the HMDS PBL program focusing on Aircraft A_O as the real goal of our efforts.

DEALING WITH PROGRAM CHALLENGES (VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, OR VUCA) *(Value: 25 pts)*

Please respond to the following prompts:

- *10 pts:* ***Describe overall VUCA faced by your project/program.***

Elbit's HMDS PBL effort was planned and executed during rapidly changing times for our country and our company. ESA has enjoyed significant success and growth in the past 5 years. It is an understatement that maintaining focus and delivering results in an environment where competition for resources can be challenging. The PBL contract relies heavily on forecasting and reliability data to ensure the right resources and materials are available to support a quick turn of a repair. It is difficult to predict the future due to an ever-changing environment and the shift in requirements that come with even the slightest change in a planned future versus reality. A change in flight hours or an unforeseen failure trend can skew numbers that drive demands that were not part of the predictions.

The response to the challenge in forecasting begins with the entire team at ESA. Once per week an Integrated Product Team (IPT) meeting is held and includes the program office and members from the operations team. The meetings take a deep dive into the repairs that are in-house and cover every topic at hand from delays in materials, paperwork issues to resource problems. These IPT meetings along with the use of a closed loop Failure reporting, analysis, and corrective action system (FRACAS) system that is reviewed by an internal Failure Review Board (FRB) are crucial to quickly identify trends and update modeling based on feedback from the repair line.

In its simplest terms, the HMDS PB L team has not had to face and react to VUCA due to extensive collaboration and planning with the customer upfront before even submitting the proposal. The program planning looked to create a business process focused on the mission, rather than the business operation. No one can say with any certain that there is not future VUCA events coming our way on this program, but results to this point indicate that the entire LM-ESA team is well prepared to handle whatever comes their way.

- *15 pts:* ***Cite specific example(s) and how your team responded.***

The IPT team recently identified a trend in a failed part on incoming repairs. We had several units coming in with damaged connectors. The connectors have a 20+ week lead-time from the supplier. Once the trend was identified in our IPT, we placed an order for stock of the connectors, as well as steps to expedite the order, so that we could avoid that long lead-time delay. Since the receipt of the material, we have had an additional 6 units come in with damaged connectors. The parts for immediate repair and return were on-hand due to the freedom of self-investment that comes with a PBL and the team's response to identified failure trends. ESA was able to procure the necessary parts ahead of the trend to avoid delays in the future, whereas in the past the parts would not be ordered until the failures occurred leading to lengthy delays and potential impacts to aircraft availability.

Figure 13: the IPT identified a trend in failed connectors and were able to immediately adjust and adapt so that a timelier repair option was available.

ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP *(Value: 40 pts)*

Please respond to the following prompts:

- *15 pts:* ***In executing the program, what unique and innovative practices, tools and systems frame your program and help you achieve program excellence***?

The HMDS PBL is admittedly Elbit's first full-up Performance Based Logistics contract, however it is a benchmark by which all our future efforts will be planned and measured. In some manner, unhindered

with the view of "this is how we did it last time", we were able to lift our sights and focus on the outcomes we desired, improved A_o and construction a program work statement to accomplish that and metrics to measure progress against that goal.

Collaboration: The high level of information sharing and collaboration between LM, S&SS program office, engineering teams from the two companies and the repair line is unlike any other program supported by ESA. Daily communication, weekly face-to-face meetings and proven results materialize in the reality that there has not been a need for s Subcontractor PMR on this sustainment effort in 4 years. Results speak louder than PowerPoint slides. Through this level of collaboration, we are able to become one team with the one goal and achieve aircraft availability.

Metric Tracking and Reporting: Elbit's ability to see immediately into LM stock levels and react quickly is a level of cooperative interaction not seen before between a large OEM and a sub-contractor on a program of this magnitude. It is a tangible work product as a result of the close team collaboration mentioned above.

Uniqueness and innovation was backed into the HMDS PBL plan from inception. The Elbit team envisioned success for this program before they even started planning. Routinely repair operations are measured on turn-around times (TAT), and although a metric to measure repair operations, it falls shirt as a true indicator of weapon system success. The dock-to-dock metric, TAT, ignores all the other detractors to mission success in the sustainment pipeline. Getting the failed unit replaced with a functional one and returning it to the Depot for Intermediate level repair has to be monitored, measured and controlled. On the other end of the repair operation getting the unit from our dock back to the user unit and on the supply room shelf ready for issue is the only thing that stops the customer's pain. The HMDS PBL team accounts for this. Communication amongst the LM-Elbit team is constant. It is not just email and spreadsheets. Right from the start the team planned weekly face-to-face meetings to review every item in the pipeline. Actions are identified and tracked to correct delays. This is critical with the different variations of the F-35 Fighter. Different software is running on each variation resulting in 3 different HDMS computers. It is not as simple as having an item fixed and on the shelf. It has to be the right variation for that platform. Some aviation units have multiple variations of the jet on their flight line, so the right unit at the right time and location is critical. The collaboration and focus of the LM-ESA team made this happen time and time again. This process focuses on the mission and strives, along with the LM team to deliver a PBL response that achieve even more than any other PBL by focusing on mission accomplishment, rather than typical turnaround times. The best product built by a supplier means nothing if they are sitting on a shelf broken awaiting repair actions. PBL contracts, typically are designed with the goal to improve logistical support beyond what is generally achieved via a traditional support contract. This is viewed as a means to that end; reducing costs by incentivizing the sustainment contractor to improve the product as they go along. However, it does not work to reduce the immediate problems of poor support. The intended result of the collaboration between ESA and LM was to design a process that supported ***the goal of improved readiness while still reducing costs*****.** Being able to improve warfighter readiness and effectiveness through better weapon system availability and reliability, at lower cost was a lofty goal, but we were able to attain it. Shifting responsibilities to the Contactor with accompanying incentives is a start, but it is the actual framework by which execution is managed that is the discriminator between throwing money at a problem and designing and implementing a solution focused on improving Ao. The LM-ESA

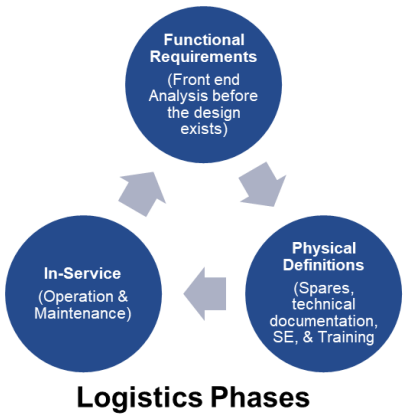

Figure 14: The HMDS PBL constantly works through all phases of the program which still in development and production at the same time.

Sustainment team needed extremely high levels of collaboration to achieve their goal and they deliver in spades.

It is a given that communication is not really unique, but the level of collaboration and focus embodied in the ESA approach takes it to new benchmark levels. Elbit worked closely with LM to tailor a SOW to meet their objectives as opposed to the transactional details. The LM-Elbit working relationship was already clicking at a high level, but by working even closer with a defined common goal, this relationship produced better outcomes every day. This type of collaboration, if not driven and goal focused could ground the process to a very slow pace. The HMDS PBL uses effective contracting to minimize cost to LM and ESA while ensuring product is on wing where it belongs. The LM-ESA F-35 Sustainment team's

High readiness levels do not have to come at the expense of higher costs was the goal from the very beginning.

weekly meetings examined every item in the system and any obstacles to progress towards repair. Purchase orders are issued to track activity, but the process is authorized in full by the master contract and funded by a monthly fee to cover Elbit's costs. Just as certain, the PBL is metric driven to ensure focus is placed on the right issues at the right time. But what is unique to the F-35 HMDS PBL and its success is the collaboration and level of details shared between ESA and LM which has created a strong team. **A strong team focused on the main program objective of F-35 A_o.** Rather than simply focusing on Turn Around Times (TAT), which is transactional in nature, Elbit focuses on average age. The average age a unit is down is a key indicator to the effectiveness of the repair operation. Even when adequate spares are available, a situation not often enjoyed early in the F-35 program, the pain starts when the unit fails and does not stop until it is returned to the supply room shelf, where it can rise to meet the next demand in sequence.

This is where our unique operation; Elbit's Integrated Optimized Repair (IOR) (Figure 3) Flow comes into play. PBL Metrics can be achieved by front loading the system with spare parts, but this is costly from the start

and increasingly so when product improvements or changes roll out during production. By separating the various maintenance tasks into independent but supportive cycles, the IOR approach focuses on Mission Accomplishment, not simply on transactional turn-around times. Additionally, the IOR, highlighted in the figure below, reduces the amount of spares the customer needs to support field readiness. Here is how this is being accomplished; by returning a failed unit to an Inventory Control Point (ICP), located at LM's logistics supply contractor, where an immediate replacement LRU is issued and sent to the requesting unit.

This approach leans forward with units ready to restock the aviation unit's stock room shelf at an Op-tempo that ensures the supply shelf never goes bare, even though PBL metrics would allow for some time in order fill. This ensures aircraft readiness, while lowering platform sustainment costs for the USG.

Logistic analytics ensure the required materials are available is the optimized IOR reducing repair times, overall inventory levels and sustainment costs

The failed unit is turned over to the Intermediate Level maintenance, which is located at Elbit's Fort Worth facility. This is where teardown, testing and evaluation (TT&E) occurs to determine which component inside the unit failed. The failed component is replaced utilizing parts already on hand and the unit is returned to the ICP for future use. This quick turnaround reduces the amount of time the unit spends in the repair cycle, further reducing costs via the number of sustainment spares required.

Failed components are transported to the D-Level facility, also located with the Elbit Fort Worth plant, for detailed component failure analysis and repair. Elbit employs a failure reporting, analysis, and corrective action system (FRACAS), using software, that provides a process for reporting, classifying, analyzing failures, and planning corrective actions in response to those failures. We use it to manage multiple failure reports and produces a history of failure and corrective actions. FRACAS records the

problems related to a product or process and their associated root causes and failure analyses to assist in identifying and implementing corrective actions. Collecting this information through all levels of maintenance and utilizing the software spine to link it all back to the original failure provides critical information for designers, logisticians and users.
Once the failed component is repaired, it is shipped back to the I-Level repair facility stock room for use in future repairs. Once optimized using FRACAS data, component levels can be adjusted and maintained to ensure timely turnaround of components, while reducing inventory levels to as required. This reduces the need for additional spare units for the customer and the contractor. Each portion of the IOR can be optimized to support the specific goals of that level.

- *15 pts:* ***What unique and innovative processes and practices are you using to develop people and transfer knowledge and how do you know they are working?***

The HMDS PBL is admittedly Elbit's first full-up Performance Based Logistics contract, however it is a benchmark by which all our future efforts will be planned and measured. In some manner, unhindered with the view of "this is how we did it last time", we were able to lift our sights and focus on the outcomes we desired, improved A_o and construction a program work statement to accomplish that and metrics to measure progress against that goal.
The entire HMDS PBL team has grown and been promoted within Elbit. This consistent sense of mission permeates the entire department. Program performance is reviewed quarterly in a Program management Review (PMR) structure consistent with all repair portfolios within S&SS. All metrics; program, finance, personnel and customer ratings, are reviewed and when necessary, specific actions assigned to make improvements.

Figure 15: The F-35 HMDS program is reviewed quarterly with executive management to ensure goals are met

- *10 pts:* **What unique practices are you using to engage customers and how do you know?**

The PBL contract utilizes a SharePoint site to collaborate on crucial information to the program's success. ESA S&SS program office has insight in the daily inventory levels at LM's stocking locations, operating hours, and reported failures in real-time, along with many other reports. The data is collected and analyzed for forecasting repair capacity and spares requirements. After the repair of a unit is completed, the failure data is then shared with LM through quarterly program reviews. In addition, the failure data is flowed back to the production line to analyze for opportunities for real-time improvements and the development of a more reliable product.
Once per week, the IPT teams from both LM and ESA meet to discuss failures that have been identified in the field. Their discussions encompass details from the Prognostic Health Monitor report to the failure description written

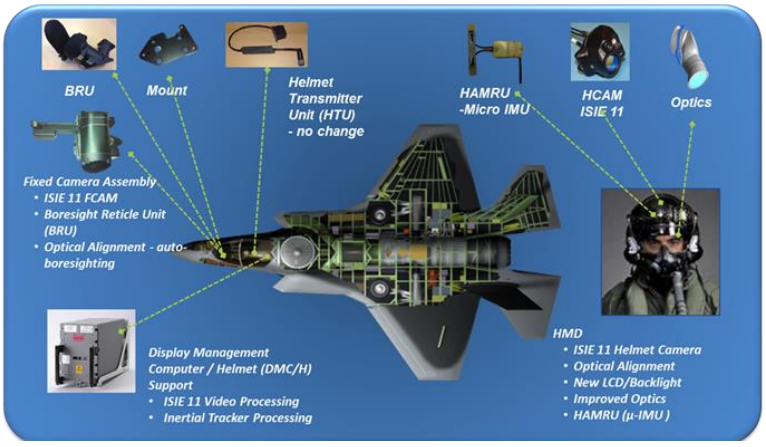

Figure 16: ESA lives by a motto that, "We provide innovative solutions that protect and save lives!" The ethos of the men and women working in the S&SS at ESA is, "We keep the Solution in the fight, 24/7!"

against the incoming unit. This information is analyzed prior to the unit arriving for repair and gives our repair team the full picture to assist with their analysis.
The high level of information sharing and collaboration between LM, S&SS program office, engineering teams from the two companies and the repair line is unlike any other program supported by ESA. Through this level of collaboration, we are able to become one team with the one goal and achieve aircraft availability.
Now in our third year of this 5-year PBL contract to support the HMDS on the F-35, there has not been a single MICAP related to any portion of the HMDS. Operational Availability (A_o), is the utmost indicator of a platform's success and the F-35 is a qualified success in that regard. Lockheed Martin (LM) and the USAF know they can rely on the Sustainment and Support Solution (S&SS) business unit at Elbit Systems of America (ESA) to keep this critical aircraft system in the fight 24/7.
ESA lives by a motto that, "**We provide innovative solutions that protect and save lives!"** The ethos of the men and women working in the S&SS at ESA is, **"We keep the Solution in the fight, 24/7!"** The best designed solution or weapon system in the world is absolutely useless if it is not mission ready or MICAP. The F-35 is a mission critical asset to our Armed Forces and the HMDS is a critical component of the aircraft systems that allows it to perform at such a high level. The purpose of the F-35 HMDS PBL program is to increase aircraft availability while minimizing cost. The HMDS availability has a direct effect upon the F-35's Operational Availability. A return and repair sustainment concept was not the optimum response to address multiple MICAPs per month, so the S&SS business unit at ESA and LM worked together to identify requirements that would better allow the program to focus on A_o.