

Application of the Integrated Product Support Elements

by the F-35 Joint Program Office

David Floyd ■ Monica Reyes

The Life Cycle Logistics community went through a major transition in April 2011 with the creation of the 12 Integrated Product Support (IPS) elements, outlined in the Department of Defense's *Product Support Manager (PSM) Guidebook*. This article aims to promote understanding of the IPS elements and to provide an update on their implementation across the Services by describing their innovative application in the F-35 Joint Strike Fighter Program. Before examining this implementation, however, let us consider the elements themselves.

The IPS Elements

The 12 IPS elements serve as a powerful enhancement and update to the traditional 10 Integrated Logistics Support (ILS) elements. Why was this done? As shown in Figure 1, the two additional elements, product support management and sustaining engineering, were added to reflect the PSM and life-cycle logistician's enhanced enterprise roles and responsibilities, which transcend the traditional logistics domain.

The PSM is a key leadership position for Acquisition Category I major defense acquisition programs. In order to identify and define the roles and activities in developing and implementing a viable product support strategy, the PSM needs to be able to interface effectively with senior leaders from other functional domains, including program management, contract management, business and financial management and systems engineering. Consequently, the product support management IPS element was created. This element provides the framework for the integration of the other 11 IPS elements, so the product support solution delivered to the warfighter is fully integrated and meets the warfighter's needs in terms of readiness, reliability and affordability.

Floyd, the Defense Acquisition University's performance learning director for life cycle management, is a certified professional logistician and Level III life cycle logistician. He is a retired Naval Reserve surface warfare officer with more than 30 years' logistics experience and is the principal author of DAU's Integrated Product Support (IPS) Element Guidebook. **Reyes** is a logistics management specialist for the F-35 Joint Program Office, global maintenance, repair, overhaul and upgrade capability. She has been with the F-35 JPO for two years and is the principal author of the RACI Matrix (responsible, accountable, consulted, informed matrix).

Report Documentation Page

Form Approved
OMB No. 0704-0188

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1. REPORT DATE AUG 2014		2. REPORT TYPE		3. DATES COVERED 00-00-2014 to 00-00-2014	
4. TITLE AND SUBTITLE Application of the Integrated Product Support Elements by the F-35 Joint Program Office				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Defense Acquisition University, Defense AT&L, 9820 Belvoir Road, Fort Belvoir, VA, 22060-5565				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



U.S. Air Force photo by Samuel King.

The sustaining engineering IPS element, a shared area of responsibility between the logistics and systems engineering communities, is the product support of in-service systems in their operational environment. It spans the technical tasks (engineering and logistics investigations and analyses) that ensure continued operation and maintenance of a system with managed (i.e., known) risk. This includes:

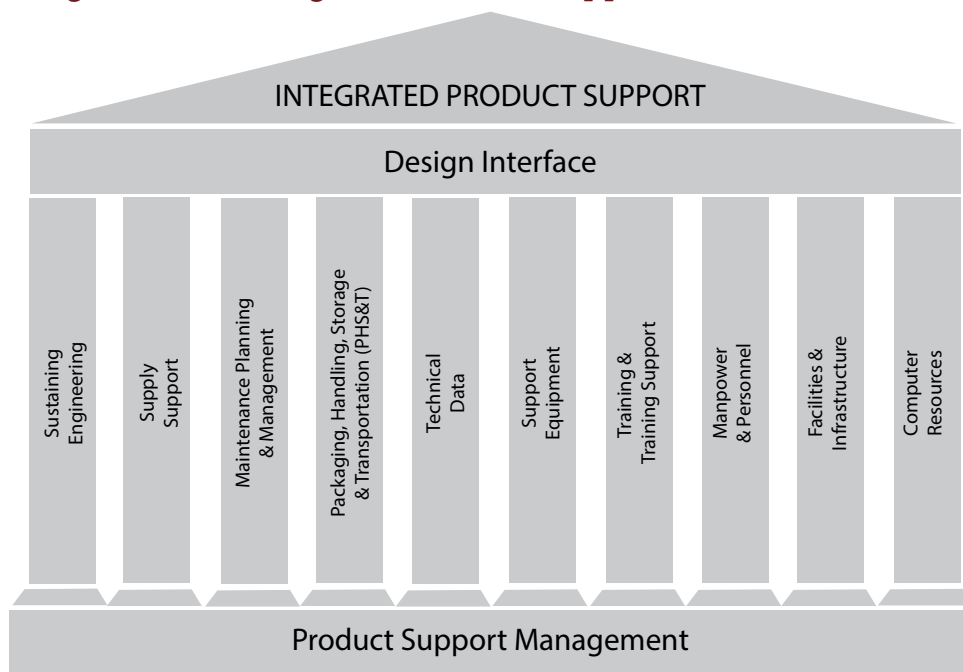
- Collection and triage of all Service use and maintenance data
- Analysis of safety hazards, failure causes and effects, reliability and maintainability trends, and operational usage profile changes
- Root cause analysis of in-service problems (including operational hazards, deficiency reports, parts obsolescence, corrosion effects and reliability degradation)
- Development of required design changes to resolve operational issues
- Other activities necessary to ensure cost-effective support to achieve peacetime and wartime readiness and performance requirements over a system's life cycle

Other modifications to the traditional 10 ILS elements include the following:

- "Maintenance planning" transitions to "maintenance planning and management," to incorporate maintenance management and execution activities along with the maintenance-planning activities.
- "Training and training equipment" becomes "training and training support," emphasizing the life-cycle focus of the training strategy and implementation.
- "Facilities" becomes "facilities and infrastructure," highlighting that facilities are more than simply "brick and mortar" buildings.
- "Computer resources support" changes to "computer resources," bringing this ILS element up to date by providing more focus on the information technology aspects of computer resources.

To facilitate implementation, execution and understanding of these 12 elements, the *IPS Element Guidebook*, fielded by the Defense Acquisition University in November 2011, provides detailed information about each of the 12 IPS elements and complements Appendix A of the *Product Support Manager Guidebook* by providing definitions for each IPS element and subelement. It also identifies key activities and products for

Figure 1. The Integrated Product Support Elements



each IPS element and provides a much-needed "how to" for these activities throughout the life cycle. The guidebook is an invaluable reference in helping the program manager (PM), PSM and life-cycle logistician answer the "what, how and when" questions of product support planning and execution.

The F-35 Joint Strike Fighter Program

The largest procurement program in the Department of Defense (DoD), the F-35 Lightning II, is a new, fifth-generation aircraft being procured in different versions for the U.S. Air Force, Marine Corps and Navy. Current DoD plans call for acquiring 2,443 of the F-35 aircraft. Hundreds of additional F-35s are expected to be purchased by several U.S. allies, eight of which are cost-sharing partners in the program. The F-35 promises significant advances in military capability, and it is critical to long-term recapitalization plans because it is intended to replace legacy fighter aircraft.

The F-35 Joint Program Office is developing and refining the product support strategy, along with the organizational roles and responsibilities. This involves the use of the RACI Matrix (otherwise known as Responsibility Matrix), a communication tool that defines the roles and responsibilities connected with various tasks by identifying the association between a particular task and an individual or organization. The letters R, A, C and I stand for responsible, accountable, consulted and informed, respectively. This tool typically is used in program management; however, it can be used for any type of project in which role and responsibility identifications are desired.

The RACI Matrix

The purpose of the RACI Matrix is to provide a comprehensive table for the F-35 Joint Program Office that will capture all essential logistics support and sustainment elements and

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serve as a useful tool in identifying roles and responsibilities for each element.

The challenge in applying the IPS elements was that their structure did not capture all operational elements necessary to maintain and support capability. By using only the IPS elements, the RACI Matrix was limited to the PM's perspective. To be useful to all stakeholders, the IPS elements needed to be expanded to include the maintenance and operational functions.

In order to capture all necessary logistics and sustainment tasks to support the F-35 program, elements from the F-35 Sustainment Work Breakdown Structure, called the OneWBS, were incorporated into the IPS element structure to form the final task structure shown in Figure 2.

The integration of IPS elements and OneWBS elements resulted in specific areas being addressed that weren't covered by using only the IPS elements. This arose from the need for an even more detailed breakdown of subelements within each specific IPS element. The integration of the OneWBS elements, which function as the IPS subelements, provided the additional detail necessary to specify the assignment of roles and responsibilities for these tasks within the RACI Matrix. Examples of this expansion are as follows:

- IPS element 4 (supply support) was expanded to address two areas:
 - Unit-level supply support
 - Wholesale-level supply support/supply chain management
- IPS Element 5 (maintenance) was expanded to address three areas:
 - Product support planning associated with maintenance
 - Unit-level maintenance

- OneWBS element →
- OneWBS element →
- OneWBS element →
- OneWBS element →

- Depot-Level maintenance
- IPS element 9 (training) was expanded to address four areas:
 - Training planning and product development
 - Pilot training and qualification
 - Training operation, maintenance and delivery
 - Maintenance training

The tasks in the left column of Figure 2 consist of the IPS elements and subelements, along with the OneWBS additions, which number in the hundreds (because multiple OneWBS additions can appear under each IPS element or subelement). The top row identifies the organizations that support or participate in the F-35 Joint Program. These include the program executive office (PEO)/PM, PSM, product support integrator and product support provider organizations among others. Currently there are 55 organizations that have been assigned roles and responsibilities documented in the RACI Matrix.

In the cells of the matrix, a letter is placed to identify each organization's role or responsibility in connection with the elements, subelements and OneWBS elements. If an organization has no role or responsibility for a particular element,

Figure 2. RACI Matrix Task Structure

	Org	Org	Org	Org
IPS Element				
OneWBS element →				
IPS Element				
OneWBS element →				
IPS Element				
OneWBS element →				
IPS Element				
OneWBS element →				

then the cell is left blank. Each organization is identified as responsible, accountable, consulted or informed as described below:

- **R = Responsible.** These organizations perform the function and are responsible for action and implementation (the doers).
- **A = Accountable.** This is the organization ultimately accountable for the function.
- **C = Consulted.** These organizations must be consulted before a final decision or action is taken.
- **I = Informed.** These organizations must be informed of a decision or action.


Let us look at a partial example of role assignment in the matrix. For the "Establish and Maintain Product Support" task, the PSM (Director of Logistics and Sustainment) is identified as "accountable," the PEO/PM are identified as "informed," the Weapons Systems Logistics Management unit (under the PSM) is identified as "responsible," the Supply Chain Management unit (under the PSM) is identified as "consulted" and many other organizations and units receive one or another of these designations.

The benefits of applying the IPS elements structure to the RACI Matrix or other program applications include:

- Assigning responsibility and accountability to participating program organizations and integrated product teams for the implementation of the IPS elements and subelement activities

- Distinguishing between government and industry roles and responsibilities for the IPS elements and subelements
- Forming the basis for a common understanding and proper expectations as the product support solution evolves
- Serving to promote consistency and comprehensiveness in the application of the IPS elements across the life cycle
- Providing structure and flexibility in the tailoring of the IPS elements to a given program application
- Contributing to the overall understanding of IPS terminology, roles, responsibilities, processes, activities and associated products for each IPS element
- Improving IPS communications, resulting in better decision making

Summary

The transition from the traditional 10 ILS elements to the 12 IPS elements has gone smoothly as it is implemented across the Services. This can be seen in the application of the IPS elements in the RACI Matrix by the F-35 Joint Program Office. The RACI Matrix demonstrates a beneficial and relevant use of the IPS elements in identifying organizational roles and responsibilities, particularly for a large, complex program. It also shows how the IPS elements structure can be flexibly tailored to meet specific program needs. Finally, it validates the need for, and value of, the IPS elements, which are documented in the DoD *Product Support Manager Guidebook* and detailed in the *IPS Element Guidebook*. 

The authors can be reached at David.Floyd@dau.mil and Monica.Reyes@jsf.mil.



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