

Engineering Procedure	Title: Interim Readiness Assessment (IRA), Ira-Extension (IRA-E) And Institutional Design Certification Review (IDCR) Procedure			Document Number: ENG-P-0021	
Unit Issuing: Engineering	Approved by: Engineering-ACAM	Initial Issue: 20 Mar 2016	Page 1 of 15	Revision: 11 Effective Date: 03/05/24	

cPURPOSE

The purpose of this procedure is to provide the policy for standardized document preparation, control, modification, processing and publication of the Interim Readiness Assessment (IRA), Form ENG-F-DE59; Interim Readiness Assessment Extension (IRA-E), Form ENG-F-DE59E; and the Institutional Design Certification Review (IDCR), Form ENG-F-DE42 for the Base Operations and Spaceport Services (BOSS) contract at Kennedy Space Center (KSC), Florida.

SCOPE AND APPLICABILITY

This procedure applies to all BOSS employees involved in initiating, reviewing and processing IRAs, IRA-Es and IDCRs. An IRA shall typically be initiated prior to the first use of the Facility, System, Equipment or Utility (FSEU) as it relates to new hardware or modified existing hardware. An IDCR is initiated upon customer request and shall typically be processed at the end of the project which modified Operationally Essential (OE) system(s). This procedure applies to BOSS Operations, Maintenance & Engineering for Facility System Project Modifications and new Facility systems related to the mission readiness process to ensure facility support systems are available and ready to meet scheduled Launch and/or Program Milestones. This relates primarily to configured systems identified by BOSS Activation Configuration & Asset Management (ACAM) in the Operation, Maintenance, Engineering, and User (OMEU) Matrix as National Aeronautical Space Administration (NASA) Operationally Essential (OE), or USSF Mission Essential (ME). This procedure is intended to meet the requirements identified in the BOSS Contract, Performance Work Statement section 4.4.1.6. If a conflict arises between this procedure and the contract, then the contract takes precedence.

1. IRA IDENTIFICATION, PREPARATION AND PROCESSING

1.1. IRA IDENTIFICATION

- 1.1.1. Approximately six weeks prior to the Milestone, ACAM begins compiling a list of IRA Candidates, if requested by the BOSS or NASA CCB chairpersons.
- 1.1.2. The applicable reports (Project Status etc.) and available sources are assembled and reviewed. IRA Candidates (typically projects) are placed on the Candidate List if they meet the following criteria:
 - The OE or ME system is considered out-of-configuration with existing drawing. Drawings for approved implemented configuration changes are in work but not complete.

- The Engineering Review Board (ERB) Chairpersons direct ACAM to process an IRA for a specific project due to mission readiness visibility.

NOTE: Ideally, there shall be only one (1) system per IRA. However Systems that fall under the Primary System Identification, such as AC (Low Voltage, Lightning Protection and Grounding) may have the option to be grouped together. If a project affects multiple OE or ME systems, there shall be multiple IRAs.

NOTE: Ideally the IRA and IDCR are intended to be worked one (1) project per form. With the NASA program requirements these documents may be adapted to be used one (1) form per system and list multiple projects. The ERB Chair persons will decide when this option will be utilized.

- 1.1.3. The Candidate List spreadsheet shall contain the following information at a minimum:

ITEM NO.	ITEM DESCRIPTION	RESPONSE
1	PROJECT NUMBER	
2	IRA CONTROL NUMBER	
3	OE OR ME SYSTEM	
4	RESPONSIBLE INDIVIDUAL	
5	WAS IRA PACKAGE APPROVED BY ERB? IF NO, INDICATE REASON IN COMMENTS SECTION	

- 1.1.4. ACAM periodically reviews the Candidate list with ACAM management and the BOSS/NASA CCB chairs to determine additions or deletions to the list.

- 1.1.5. The Candidate list will be maintained on the ACAM Share drive.

1.2. IRA PREPARATION

- 1.2.1. An IRA form ENG-F-DE59 will be completed for each IRA candidate.

1.3. IRA PROCESSING

- 1.3.1. ACAM will post the IRA in ProjectWise and send e-mail requests, with the ProjectWise link, for review and signature to all stakeholders.
- 1.3.2. If a NASA waiver is required, the responsible System Engineer (SE) shall process a NASA KSC Form 23-619, *Deviation/Waiver Request*, in accordance with QAL-P-0021, *Deviation, Waiver and Request for Relief*, procedure and the documentation shall be included with the IRA package. The Waiver will be listed in the SE section comments.
- 1.3.3. Quality, Safety, and Environmental (QSE) will review for any impacts. If a Hazard/Risk Analysis (HAZ/RA) is required, the appropriate block on the IRA form updated stating the requirement rationale. QSE will initiate the HAZ/RA and record the Safety System assessment (SSA) number on the form.
- 1.3.4. If a HAZ/RA is not required, the IRA is marked accordingly and signed by the QSE.
- 1.3.5. AHJ Delegate approval shall be required for Fire Alarm and Fire Suppression Systems.
- 1.3.6. IRAs with HAZ/RA shall be reviewed and approved at the BOSS ERB.
- 1.3.7. All other IRAs can be ERB approved via Approval Outside of Board (AOB) process.
- 1.3.8. Once approved by the ERB, ACAM releases the IRA package into NASA TechDocs through the Engineering Data Center (EDC) via KSC Form 21-168, *Document Release Authorization* (DRA).

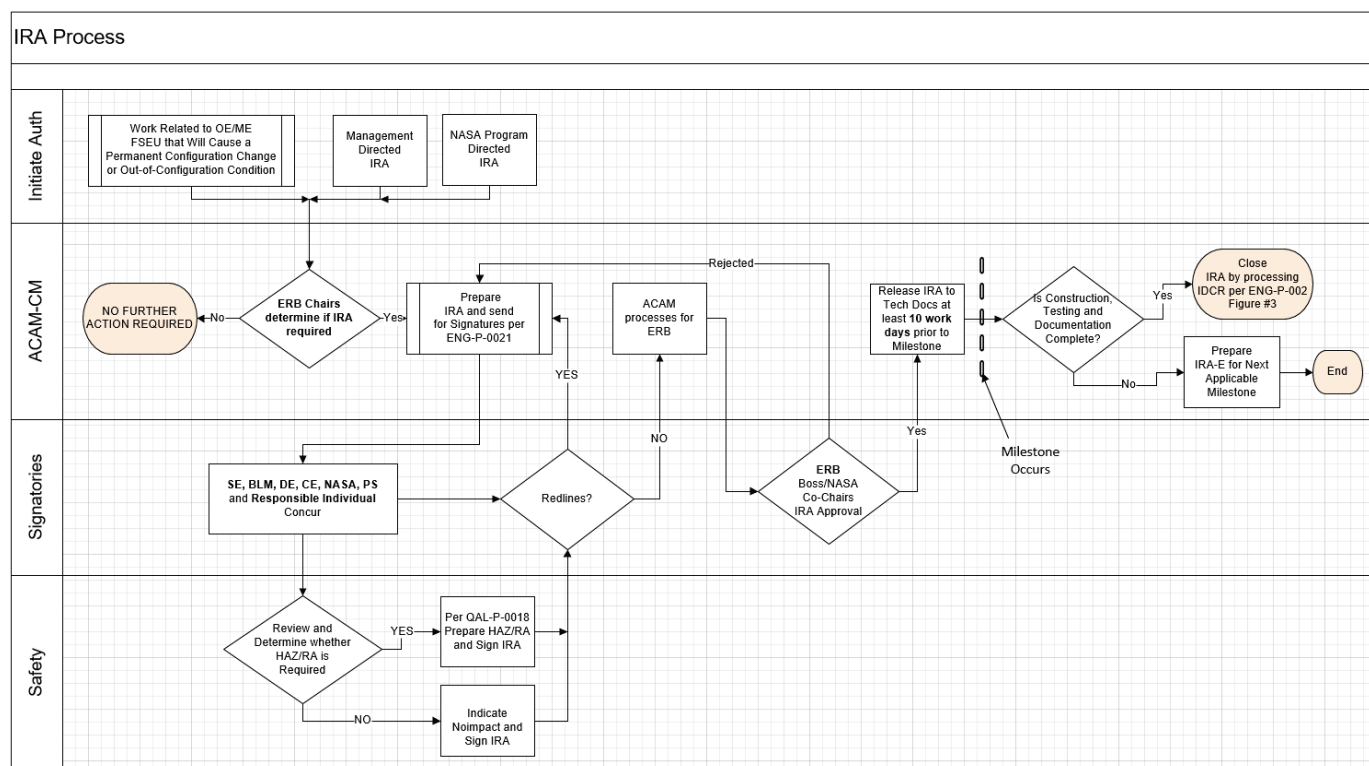


FIGURE 1: INTERIM READINESS ASSESSMENT PROCESS

2. IRA EXTENSION (IRA-E) IDENTIFICATION, PREPARATION, AND PROCESSING

2.1. IRA-E IDENTIFICATION

- 2.1.1. Approximately six (6) weeks prior to a Program Milestone, ACAM begins compiling a list of IRAs to be extended as an IRA-E.
- 2.1.2. The list of IRA-Es will include the IRAs and IRA-Es from the previous Program Milestone where the system configuration remained the same as the original IRA processed. When an IDCR is being processed that closes an IRA, these IRA's shall not require further extension and shall be excluded from the list.

2.2. IRA-E PREPARATION

- 2.2.1. ACAM will set up the IRA-E in ProjectWise and send requests for review and signature to all stakeholders via e-mail to the ProjectWise link.
- 2.2.2. The IRA-E extension form ENG-F-DE59E provides detailed instructions for completing the form.

2.3. IRA-E PROCESSING

- 2.3.1. IRA-Es with HAZ/RA shall be reviewed and approved at the BOSS ERB.

2.3.2. All other IRA-Es can be ERB approved via Approval Outside of Board (AOB) process.

2.3.3. Once approved by the ERB, ACAM releases the IRA-E into the EDC via KSC Form 21-168, DRA.

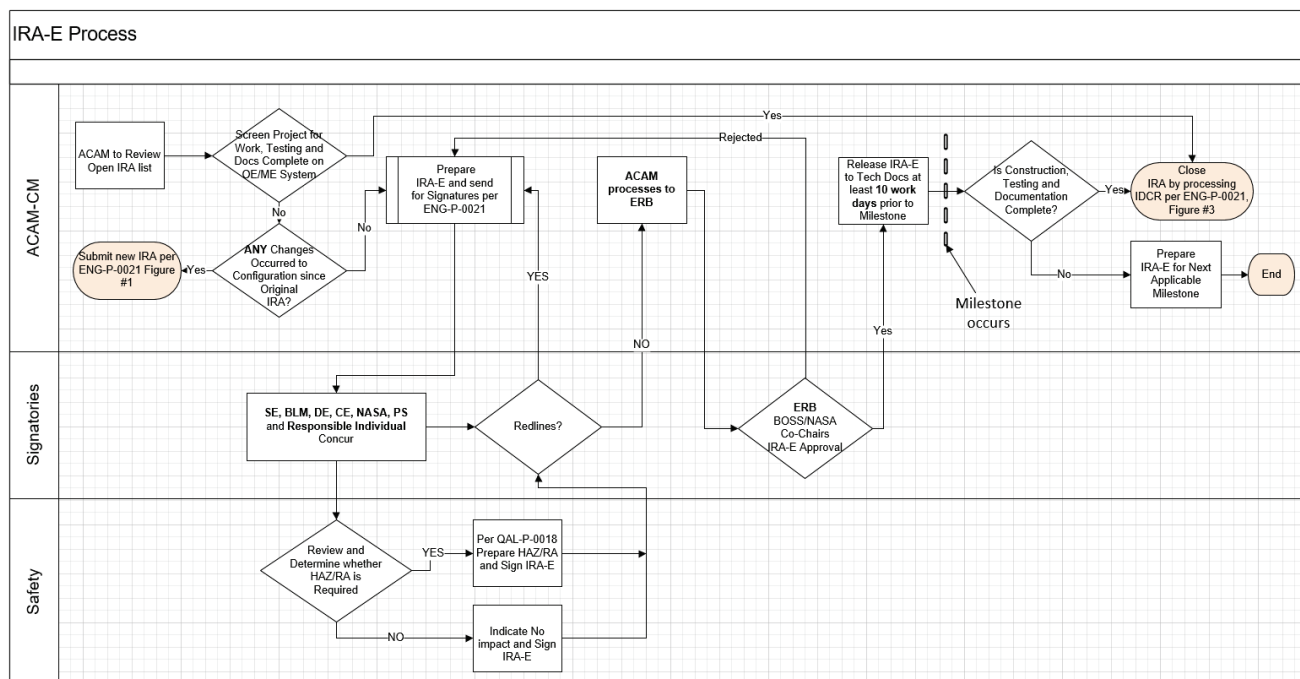


FIGURE 2: INTERIM READINESS ASSESSMENT EXTENSION PROCESS

3. IDCR IDENTIFICATION, PREPARATION AND PROCESSING

3.1.1. ACAM compiles a list of Interim Design Certification Review (IDCR) Candidates, if requested by the BOSS or NASA CCB chairpersons.

3.1.2. The projects to be included are identified by:

- 1) The NASA or BOSS CCB Chairpersons identify on the ENG-F-DE10, *Project Summary and Documentation Planning Form*, that a IDCR is required, or,
- 2) The NASA Program office requests a IDCR of specific systems, or,
- 3) The SLS Program Ground Integration Engineering (GIE) office requests a IDCR of specific systems.

3.2. IDCR IDENTIFICATION

3.2.1. An IDCR form, ENG-F-DE42, is required to be completed when:

- 3.2.1.1. When work on a specified OE (E) or ME (A) system will be started and completed before the identified Milestone occurs, or,

- 3.2.1.2. When all work, testing and documentation listed on the Project Summary and Documentation Planning Form (PSF) ENG-F-DE10 (Also known as a DE-10 Form) associated with the identified OE or ME system is complete, or,
- 3.2.1.3. When the ERB Chairpersons request a review of a non OE or ME system to have an IDCR based on visibility to the Milestone operation.
- 3.2.2. When the ERB Chair waives completion of specified documentation listed on the DE-10. The waived documentation shall be completed at a later date.

3.3. IDCR PREPARATION

- 3.3.1. ACAM completes the form ENG-F-DE42, attaches the DE10 form, IRA Document, (if applicable), IRA-Es (if applicable), HAZ/RA (if applicable), As-Built Drawing related pages.
- 3.3.2. ACAM will post the IDCR in ProjectWise and send e-mail requests, with the ProjectWise link, for review and signature to all stakeholders.
- 3.3.3. The NASA TechDocs number shall be included on the IDCR package and IDCR Cover Page.

3.4. IDCR PROCESSING

- 3.4.1. All IDCR packages related to active programs shall be processed through the ERB, if a HAZ/RA is required.
- 3.4.2. AHJ Delegate approval shall be required for Fire Alarm and Fire Suppression Systems.
- 3.4.3. IRAs with HAZ/RA shall be reviewed and approved at the BOSS ERB.
- 3.4.4. All other IRAs can be ERB approved via Approval Outside of Board (AOB) process.
- 3.4.5. Once approved by the ERB, ACAM releases the IDCR package into NASA TechDocs via DRA KSC Form 21-168. The NASA TechDocs number shall be included on the Controlled Unclassified Information (CUI) Determination Form/Export Determination Request (EDR) KSC Form 7-657 and the DRA KSC Form 21-168.
- 3.4.6. The approved IDCR closes any IRAs and IRA-Es associated with that system for that project or phase of project when the associated modifications have been completed.

3.4.7. Figure 3 illustrates the IDCR process flow.

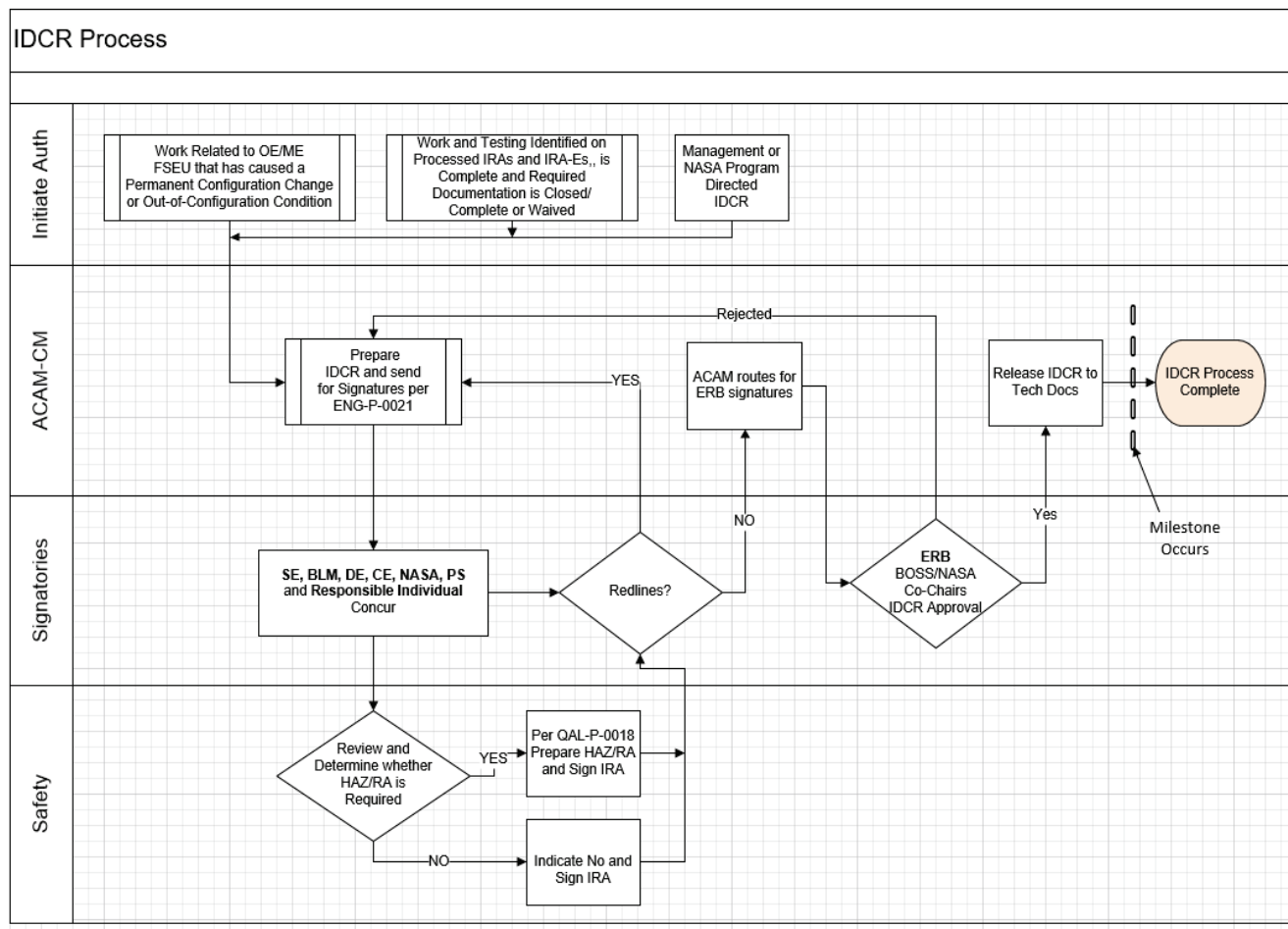


FIGURE 3: INSTITUTIONAL DESIGN CERTIFICATION REVIEW (IDCR) PROCESS

4. SYSTEM VERIFICATION&VALIDATION

Verification & Validation requirements for facility system modifications shall typically be documented during the final stages of Construction of Facilities (CoF) project implementation and reported through the NASA System Acceptance Review (SAR) by the NASA engineering representative overseeing the project. For Heritage systems and In-House modifications, where applicable, system Verifications & Validations shall be coordinated by the NASA System Engineering representatives and typically be performed by BOSS and documented in Maximo. The Maximo document number noting the satisfaction of the Verification & Validation requirements shall be referenced on the IDCR as part of the system certification review.

5. SYSTEM MODIFICATIONS

Facility system modifications on OE or ME systems shall require that all Verification & Validation testing and inspection requirements be satisfied with objective evidence prior

to system activation for “First Use” in support of mission milestones. The IDCR process is intended to document that the appropriate organizations, i.e., ACAM, Design Engineering, System Engineering, Chief Engineering, O&M, System Safety, NASA Center Operations, and NASA Safety have reviewed the project and classified it for risk potential and/or additional processing as follows:

- The project implemented Like-for-Like replacement and the latest configuration drawing documentation matches the field configuration. As such, **there is no additional system or program risk** associated with the change.
- Even though the implemented project(s) impacts the configuration. The configuration identified in IRA BLOCK 12 or IDCR BLOCK 13 does not have potential to result in an unacceptable program risk. As such, **there is no additional system or program risk**.
- The implemented project impacts the configuration. The configuration identified in IRA BLOCK 12 or IDCR BLOCK 13 has potential to result in an unacceptable program risk. **Risk Assessment shall be performed to determine risk level.**
- The modified configuration **DOES NOT** fully meet the approved system requirements; the responsible System Engineer shall refer to procedure QAL-P-0021, *Deviation, Waiver and Request for Relief*, for completing the necessary form.
- The project’s Open Items on the ENG-F-DE10 (DE10) that are deemed necessary for Milestone support shall be listed, noting the Estimated Completion Date (ECD) of each. The Baseline Manager (BLM) shall be responsible for updating the DE10.

RECORDS

The following records are retained by the organizations listed below:

Record	Responsible Organization	NRRS/Item#	Retention Period
Project and Configuration Management System ACAM Module	ACAM	08/107.0	Destroy/delete between 0 and 30 years after program/project termination. See Note 4
IDCR Package	ACAM	08/107.0	Destroy/delete between 0 and 30 years after program/project termination. See Note 4
IRA Candidate List	ACAM	08/107.0	Destroy/delete between 0 and 30 years after program/project termination. See Note 4
IRA/IRA-E Package	ACAM	08/107.0	Destroy/delete between 0 and 30 years after program/project termination. See Note 4
KSC Form 23-619	NASA Institutional Requirement Deviation/Waiver	08/107.0	Destroy/delete between 0 and 30 years after program/project termination. See Note 4

ROLES AND RESPONSIBILITIES

Division Manager: Ensures compliance within the Division to the requirements stated in this procedure.

Chief Engineer: Ensures compliance for all Design and Sustaining level requirements stated in this procedure.

Engineering Manager: Ensures compliance at the Design Engineering Department level for all requirements stated in this procedure.

Activation, Configuration & Asset Management (ACAM): Coordinates the preparation of the IRA, IRA-E and IDCR forms in accordance with the procedure. Creates DRA for the release to NASA TechDocs through the Engineering Documentation Center (EDC).

ACAM Lead: Oversees the IRA, IRA-E and IDCR processes. Updates procedures.

ACAM Baseline Manager: Responsible for updating ENG-F-DE10 indicating any open documentation for the affected OE or ME system(s) per ENG-P-0002. Provide input to ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42. Release completed IRA, IRA-E and IDCR packages into EDC.

Construction Services: Provide input to ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42.

Engineering: Provide input to ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42. Provide concurrence, once form is complete, on ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42.

FSEU OM&E: Provide input to ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42.

BOSS Engineering Review Board (ERB): Board chartered under ENG-P-0019. IRA, IRA-E (with HAZ/RA), and IDCR review and approval.

IRA/IDCR Review Board: Board chartered under ENG-P-0019. IRA review for Risk Assessment requirement.

Logistics: Process SPAs as required. Provides input to spares availability.

Protective Systems: Provide concurrence, if required, on ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42.

System Engineer (SE): Provide input to ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42. Collaborate with the Responsible Individual to provide a detailed description of the configuration change. Process the Deviation, Waiver and Safety Variance per procedure (QAL-P-0021), if required.

Quality, Safety, and Environmental (QSE): Provide input to ENG-F-DE59, ENG-F-DE59E and ENG-F-DE42. Prepare HAZ/RA, System Safety Assessment (SSA) for affected OE or ME system(s) where applicable.

REFERENCE DOCUMENTS

The following documents are referenced in this procedure:

Document Number	Title
BC-0003	Boards and Committees Charter Form
ENG-F-DE10	Project Summary and Documentation Planning Form
ENG-F-DE42	Institutional Design Certification Review (IDCR) Form
ENG-F-DE59	Interim Readiness Assessment (IRA) Form
ENG-F-DE59E	Interim Readiness Assessment Extension (IRA-E) Form
ENG-I-0029	BOSS Engineering Meeting Calendar
ENG-P-0002	Configuration Management of Facilities/Systems/Equipment/Utilities
ENG-P-0019	BOSS Engineering Review Board
KSC Form 21-68	Documentation Release Authorization (DRA)
NNK08OC01C	Institutional Services Contract, Attachment J-1, Section 4.9
QAL-F-0008	F/S/E Risk/Criticality Assessment Data Sheet
QAL-P-0017	System Safety Hazard And Risk Assessments
QAL-P-0021	Deviation, Waiver and Request for Relief
TDC-P-0001	Control of Engineering Documentation
KSC Form 23-619	NASA Institutional Requirement Deviation/Waiver

ACRONYMS

ACAM	Activation, Configuration, & Asset Management
AHJ	Authority Having Jurisdiction
AOB	Approved Outside of Board
BLM	Baseline Manager
BOSS	Base Operations and Spaceport Services
CCSFS	Cape Canaveral Space Force Station
CERE	Chief Engineer Representative Engineer
CE	Chief Engineer
CM	Configuration Management
CUI	Controlled Unclassified Information
DOCCL	Document Closure
DRA	Documentation Release Authorization, KSC Form 21-68
ECD	Estimated Completion Date
EDC	Engineering Documentation Center
ERB	Engineering Review Board
FSEU	Facility, System, Equipment or Utility
GIE	Ground Integration Engineering
HAZ/RA	Hazard/Risk Assessment
IRA	Interim Readiness Assessment (ENG-F-DE59)
IRA-E	Interim Readiness Assessment Extension (ENG-F-DE59E)
IDCR	Institutional Design Certification Review (ENG-F-DE42)
KSC	Kennedy Space Center
ME	Mission Essential (Air Force)
NASA	National Aeronautics and Space Administration
OE	Operationally Essential (NASA)
OMEU	Operations, Maintenance, sustaining Engineering and User
O&M	Operations and Maintenance
PCMS	Project and Configuration Management System
RI	Responsible Individual
QSE	Quality, Safety & Environmental
SAR	System Acceptance Review
SPA	Spare Parts Analysis
SSA	System Safety Assessment
SE	System Engineer
TechDoc	NASA Technical Documentation management system
WON	Work Order Number

DEFINITIONS

Activation and Turnover Module of PCMS: The ACAM module of the database that retains the pertinent information necessary for tracking/monitoring turnover activity by project number, including, but not limited to, Work Order Number (WON), project title, contract number, customer, scope of work, affected facility(ies), affected system(s), turnover status and significant dates during the project completion and ultimate turnover. This database auto-generates forms, reports and correspondence used during the turnover process and feeds information to reports and tables used by other BOSS groups. IRAs, IRA-Es and IDCRs are not necessarily part of the Turnover process, but information contained within this module of the PCMS is used in support of their preparation. Also, notes regarding these documents are entered into this module of the PCMS.

Chief Engineer (CE): BOSS office that provides technical evaluation and engineering support.

Configuration Management (CM): BOSS office that provides Configuration Management for Operationally Essential or USSF Mission Essential FSEU.

Design Engineer: The Engineer primarily responsible for project design and specifications, assuring design complies with KSC-DE-512-SM and user-specified program requirements. This is typically the Customer.

Engineering Review Board (ERB) Minutes: The final list of all IRAs and IDCRs which had been presented for ERB Chair and Co-Chair signature.

IDCR Package: The final package prepared once all project work, testing, and required documentation is complete. Once the IDCR package is signed by all stakeholders it is processed to the KSC EDC using a DRA.

IRA Candidate List: A running list of projects identified which have the potential to require an IRA. The list is reviewed at the IRA Screening Meeting.

IRA/IRA-E Package: The IRA document and associated extensions, hazard assessment and backup documentation, which has been processed for approval through either the IRA ERB or AOB. Once the IRA/IRA-E package is signed by all stakeholders it is processed to the KSC EDC using a DRA.

ME: Mission Essential. ME applies only to systems belonging to the USSF.

OE: Operationally Essential for NASA system.

OMEU: A listing of FSEU at Kennedy Space Center (KSC), Cape Canaveral Space Force Station (CCSFS) and selected sites at Patrick Space Force Base (PSFB) and the Annexes. Operations, Maintenance, sustaining Engineering and User (OMEU)

responsibilities are listed for each FSEU line item. The OMEU report is available on the BOSS Home Page.

Project and Configuration Management System (PCMS): The database utilized by several integrated BOSS divisions including, but not limited to, Engineering, Construction Management, Construction Services, Configuration Management and Activation & Turnover. The database contains information necessary in the preparation of IRAs, IRA-Es and IDCRs, and the ENG-F-DE10 is produced from this database.

PCMS ACAM Module: The module is a section of the PCMS maintained by ACAM to include new projects and update existing projects information throughout the project's lifecycle.

Protective Systems: The generic name for Fire Suppression and Fire Alarm systems.

Safety System Assessment (SSA): A risk based analysis performed to document safety related hazards and to identify potential mitigating controls for hazards associated with systems, user interfaces (hardware and/or software) as well as mission processing operations.

SPA: Spare Parts Analysis. Performed to ensure the availability of spare parts for planned maintenance and replacement parts for those components that have been assigned to reactive (run-to-failure) maintenance practice or that require planned repair based on inspection findings.

NASA TechDoc: NASA Technical Documentation Management System. A web-based document management system designed to manage any type of document or file including, but not limited to, procedures, drawings, specifications and BOSS forms.

Validation: Objective evidence the designed system meets stakeholders expectations.

Verification: Objective evidence the system functions as designed.

REVISION RECORD

The following revisions have been applied to this document:

Revision Number	Change Description	Date
0	Initial Release	03/14/2007
1	Removes "JBOSC Proprietary" tags	05/30/2007
2	Significant changes to processes, forms and flowcharts	06/20/2007
3	Document revised in its entirety	11/25/2009
4	Adds information regarding new form (IRA-E) and updated information regarding flow and form for IDCR	06/08/2010
5	Updated Record Table (No Review Required)	3/31/2011
6	Remove references to Shuttle and general update of entire document	06/14/2012
7	General refresh to ensure the document will comply with the known requirements of the Firm Fixed Price Contract	08/12/2015
8	Complete revision.	03/02/2016
9	Update to BOSS format	03/19/2020
10	Update KSC Form number	05/27/2020
11	Engineering review. Minor administrative edits.	03/05/24

DOCUMENT APPROVALS

3/11/2024

X Sandra Burchfield

Sandra Burchfield
Division Director, Engineering
Signed by: SANDRA BURCHFIELD (affiliate)

4/16/2024

X Daniel Silva

Daniel Silva
Lead, ACAM
Signed by: DANIEL SILVA (affiliate)

3/8/2024

X Joshua Coulter

Josh Coulter
Chief Engineer
Signed by: Joshua Coulter (affiliate)