

MAPR-4Ds Assembly Product Structure

SAND2020-2795C

- One Common Part-Centric Product Structure while maintaining site autonomy

PLM curbrow

Products > MAPR-4Ds > Product Structure

Part - 5A0470D01-000, OPTIMIZED RASR PAYLOAD, MEP, A.14 (As-Designed)

Identity	SITE	CAGEC
5A0470D01-000, OPTIMIZED RASR PAYLOAD, MEP, A.14 (As-Designed)	SA	14213
5a0470d01-000-unc.asm, A.6		14213
2E4450D01-000, TUBE, PAYLOAD, A.7 (As-Designed)	SL	14214
2E4451D01-000, PLATE, TOP, A.7 (As-Designed)	SL	14214
5A0543D01-000, SPAR, A.9 (As-Designed)	KC	14213
5A0846D01-000, ASSEMBLY, INSTRUMENTATION, A.1 (As-Designed)		14213
5A0468D01-000, PLATE, TRANSITION, A.2 (As-Designed)	SA	14213
5A0469D01-000, STANDOFF, A.7 (As-Designed)	SA	14213
6K1200D01-000, BASE PLATE, A.0 (As-Designed)	LA	88516
NAS1352-5-12, SCR,SCH.,3125-18UNRC-3A,.750 L, A.9 (As-Designed)		80205
6K1201, RING, PARACHUTE, A.5 (As-Designed)	LA	88516
9T9998D01-000, PLATE, DECK, A.3 (As-Designed)	LL	14067
9T9999D01-000, RING, SUPPORT HALF, A.3 (As-Designed)	LL	14067

MAPR-4Ds: PDM Baseline

- Top-Level Assembly Baseline
- Managed Baselines, used to create a record of a set of parts and document versions within a specific configuration. Baselines describe a product at a specific stage of design or design milestone.

Products > MAPR-4Ds > PDMLink Business Objects > Baselines

Managed Baseline - 0000004952 (BL-UNIV-1001, HYBRID RASR PAYLOAD, MEP, 2019-07-17 07:25 MDT)

Details Related Objects History

Baseline Objects | Contexts

Baseline Objects | All

			Name		Number ↑	Version	State	Last Modified	Context
			TUBE		2E4450D01-000	A.7	WIP	2019-06-24 16:51 MDT	MAPR-4Ds
			TUBE, PAYLOAD		2E4450D01-000	A.6 (As-Designed)	WIP	2019-07-17 09:00 MDT	MAPR-4Ds
			PLATE, TOP		2E4451D01-000	A.9	WIP	2019-06-25 14:54 MDT	MAPR-4Ds
			PLATE, TOP		2E4451D01-000	A.7 (As-Designed)	WIP	2019-06-25 14:54 MDT	MAPR-4Ds
			PLATE, TOP (MEMBER 1)		2E4451D01-M00	A.10	WIP	2019-08-14 12:12 MDT	MAPR-4Ds
			PLATE, TRANSITION		5A0468D01-000	A.1 (As-Designed)	WIP	2019-06-20 15:32 MDT	MAPR-4Ds
			PLATE, TRANSITION		5A0468D01-000-UNC.ASM	A.3	WIP	2019-05-22 11:00 MDT	MAPR-4Ds
			PLATE, TRANSITION (MEMBER 1)		5A0468D01-M00	A.11	WIP	2019-08-04 14:31 MDT	MAPR-4Ds
			SPAR		5A0543D01-000	A.6 (As-Designed)	WIP	2019-06-20 16:43 MDT	MAPR-4Ds
			SPAR		5A0543D01-000-UNC.ASM	A.1	WIP	2019-06-20 12:56 MDT	MAPR-4Ds
			SPAR (MEMBER 1)		5A0543D01-M00	A.6	WIP	2019-06-20 12:56 MDT	MAPR-4Ds
			PLATE, DECK		9T9998D01-000	A.3 (As-Designed)	WIP	2019-07-18 11:16 MDT	MAPR-4Ds
			PLATE, DECK		9T9998D01-000-UNC.ASM	A.4	WIP	2019-07-18 11:16 MDT	MAPR-4Ds
			RING, SUPPORT HALF		9T9999D01-000	A.2 (As-Designed)	WIP	2019-06-20 15:32 MDT	MAPR-4Ds
			RING, SUPPORT HALF		9T9999D01-000-UNC.ASM	A.3	WIP	2019-06-19 15:45 MDT	MAPR-4Ds
			RING, SUPPORT HALF (MEMBER 1)		9T9999D01-M00	A.3	WIP	2019-06-19 11:55 MDT	MAPR-4Ds
			WASHER,.174ID,.375OD,.016THK		AN960C8L	A.1 (As-Designed)	REL	2016-11-09 15:47 MST	LIB-WR Approved H...

MAPR-4Ds: Product Data Management

- Change Management



Products > MAPR-4Ds > ... > Change Management

Problem Report - 15727, A Accepted

Details Process History Collaboration

Attributes | More Attributes | Attachments | Annotations | Affected Objects | Affected End Items | Associated Process Objects | Associated Reference Objects

Attributes

Name: Post-flight damage observed for August flight - Baseline 0000004952 (BL-UNIV-1001, HYBRID RASR PAYLOAD, MEP, 2019-07-17 07:25 MDT)

Category: 17-Product Improvement

Description: Post-flight damage from RASR OSU flight. Spar, plates/deck, insert(s). Requesting formal CR for TRB/CRB review to identify causes and disposition.

Attachments (9 objects)

Label or File Name	Format	Attachment Description
IMG_3798.JPG	JPEG Image	Spar breakage at plate/deck connection
IMG_3811.JPG	JPEG Image	Plate/deck breakage
IMG_3802.JPG	JPEG Image	Plate/deck breakage
IMG_3803.JPG	JPEG Image	Plate/deck breakage
IMG_3809.JPG	JPEG Image	Spar to deck separation
IMG_3810.JPG	JPEG Image	Overall
IMG_3798-1.JPG	JPEG Image	Spar break close
IMG_3800.JPG	JPEG Image	Sensor separation from ring
August Flight Baseline		Baseline of definition for flight

(0 objects selected)

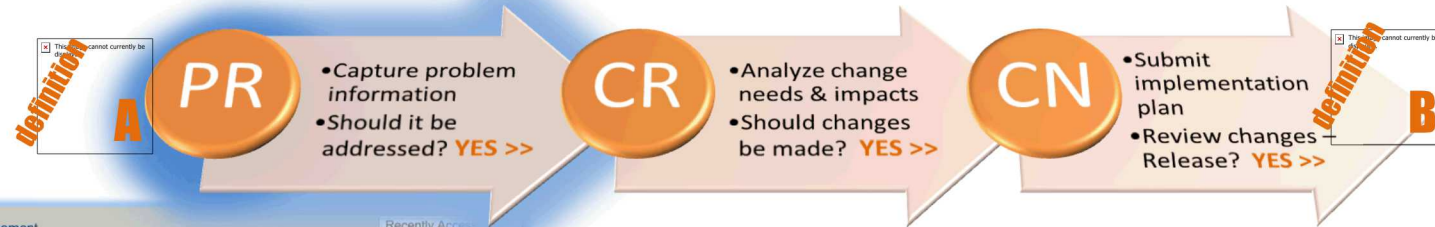
Affected Objects All (2 objects)

Number	Version	Name	State
UNIV-1001	A.1	UNIV-1001, HYBRID RASR PAYLOAD, MEP WIP	
UNIV-1001	A.1 (As-Designed)	HYBRID RASR PAYLOAD, MEP	WIP

(0 objects selected)

MAPR-4Ds: Product Data Management

- Change Management



Problem Report

Attributes | More Attributes | Attachments | Annotations | Affected Objects | Affected End Items | Associated Process Objects | Associated Reference Objects

Attributes

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Attachments

Label or File Name	Format	Attachment
IMG_3798.JPG	JPEG image	Spar break
IMG_3811.JPG	JPEG image	Plate/deck
IMG_3802.JPG	JPEG image	Plate/deck
IMG_3803.JPG	JPEG image	Plate/deck
IMG_3809.JPG	JPEG image	Spar to deck
IMG_3810.JPG	JPEG image	Overall
IMG_3798-1.JPG	JPEG image	Spar break
IMG_3800.JPG	JPEG image	Sensor sep
August Flight Baseline		Baseline of

Problem Report - 15727, A

Change Administration indicates failure is not acceptable and analysis to correct must be submitted via a Change Request

Process Status

Name	Assignee	Role	Vote	Comments
Submit Problem Report		Submitter		Curtis, please review problems found and determine whether the failure is acceptable or we need to address.
Validate Problem Report		Change Administrator	Accepted	Approving to move forward as delegate for Curtis Brown. Curtis and indicates that these failure results must be addressed prior to next flight. A CR analysis is requested to have TRB and CRB members identify appropriate design changes needed, and cost, scope, and schedule impacts.
Create Change Request		Assignee		Assigning Sarah as delegate to Eric for TRB representation to assemble the TRB, analyze the design, and collect resulting technical change recommendations from the TRB.

Affected Objects

Number	Version	Name	State
UNIV-1001	A.1	UNIV-1001, HYBRID RASR PAYLOAD, MEP WIP	
UNIV-1001	A.1 (As-Designed)	HYBRID RASR PAYLOAD, MEP	WIP

High level post-flight problems captured

Post flight evidence of failure captured

At time of problem, the most we know is that the entire assembly has issues. The PR is meant to capture those issues whether change is recommended or not

MAPR-4Ds: Product Data Management

- Change Management



Change Request

Number: 19698

Name: Identify modifications needed to address PR: Post-flight damage observed for August flight - Baseline 000004952

Members | Tasks for Change Process | Routing/Process History | Discussions

Change Request Workflow_19698, A

(1 objects selected)

Recommendation to move forward with changes is made by PRT (TRB/CRB)

Process Status (3 objects)

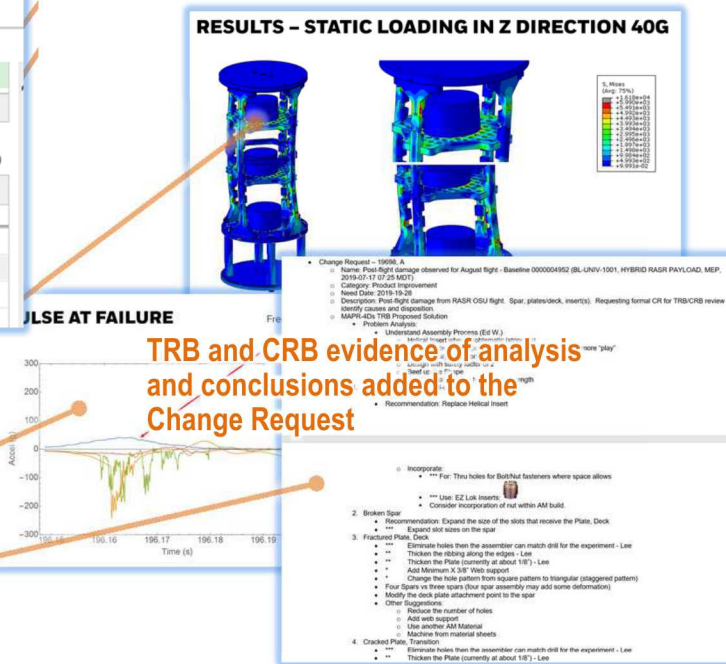
Name	Assignee	Role	Vote	Comments
Create New Change Notice	Change Administrator II			
Submit Change Request	Submitter			
Analyze Change Request	Change Administrator I	Fast_Track	TRB and CRB have approved to move into CN	

4. Total - \$25k with contingency buffer

Attachments (13 objects)

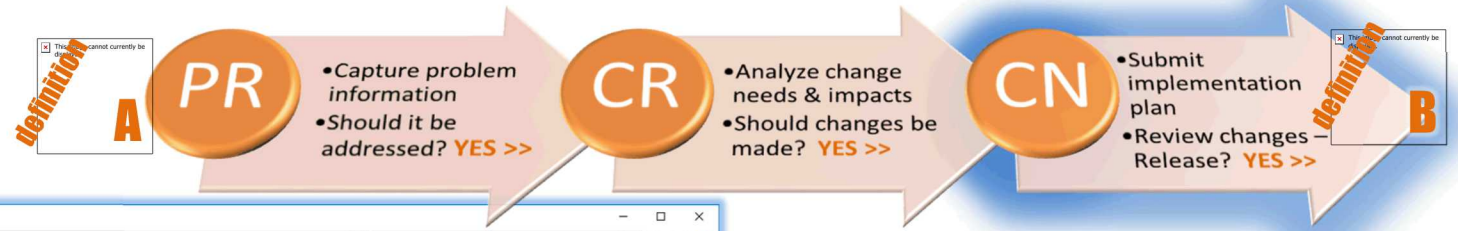
Label or File Name	Format	Attachment Description	Last Modified
IMG_3810.JPG	JPEG Image	All failures	2019-09-03 17:25...
IMG_3798.JPG	JPEG Image	Spar breakage at plate/deck connection	2019-08-21 08:59...
August Flight Baseline		Version/configuration of product definition set used for flight	2019-09-03 17:25...
Post-Flight Failure Simulation Analysis		Simulation analysis of failures encountered	2019-09-03 18:23...
Post-Flight TRB Analysis		TRB minutes found in Agenda - 20190827	2019-09-04 09:14...
Post-Flight TRB Analysis 2		Further simulation analysis by TRB	2019-09-04 09:22...
Post-Flight TRB Conclusions		TRB minutes found in Agenda - 20190903	2019-09-04 09:22...

- Request of TRB and CRB to:
- Analyze problem
 - Propose solution(s)
 - Provide scope impacts
 - Provide schedule impacts
 - Provide cost impacts



MAPR-4Ds: Product Data Management

- Change Management



The screenshot displays the 'Submit a Service Request' interface for a 'Change Notice - 14362, A'. The main content area is titled 'Change Notification' and shows the following details:

- Number:** 14362
- Name:** Identify modifications needed to address PR, Post-flight damage observed for August flight - Baseline 000004952 (BL-UNIV-1001, HYBRID RASR PAYLOAD, MEP, 2019-07-17 07:25 MDT)
- Category:** Product Improvement

The 'Implementation Plan' section contains a table with the following data:

Number	Revision	Name	S	Assignee	Reviewer	Need Date
15383	A	Base Plate modifications				2019-09-17
15384	A	Support Ring Half modifications				2019-09-17
15380	A	Deck Plate modifications				2019-09-17
15385	A	Standoff modifications				2019-09-17
15381	A	Transition Plate modifications				2019-09-17
15360	A	Spar modifications				2019-09-17
15382	A	Top Plate modifications				2019-09-17
15400	A	Tube modifications				2019-09-18

Below the table, a detailed description for item 15400 is visible:

- o Increase thickness of platform from 1/8" to .200"
- o Add Cross Members 3/8" thickness
- o Thicken the overall plate to accommodate Inserts
- o Use 10-24 EZ Press-Fit Expansion Insert for Plastic
- o Increased thickness of platform from 1/8" to .200"
- o Increased ridge thickness
- o Added Cross Members 3/8" width
- o Changed Hole Pattern
- o Thicken the overall plate to accommodate Inserts
- o Change hole pattern to more of a stagger

All PR and CR information carried forward

TRB and Change Administration identifies specific product definition changes

Change Administration develops Implementation Plan, with Designer assignment for each definition change task

Once all changes are made, reviewed/approved by Technical Reviewer and Change Administration, all definition released at Revision B

MAPR-4Ds: Product Data Management

- New Design/Product Structure Developed at Version B.0

The screenshot displays a CAD software interface for a product structure. The main window shows a 3D model of a dark grey, cylindrical component with a circular flange at one end. The flange has several green cylindrical features arranged in a circle. The main window is titled "Part - UNIV-1001, HYBRID RASR PAYLOAD, MEP, B.8 (As-Designed)".

The interface includes a top navigation bar with tabs for "Details", "Structure", "Related Objects", "Changes", "History", "Where Used", "Traceability", "Part Configuration and Part Instances", "Notes", and "Collaboration". Below this is a toolbar with various icons for editing, checking out, clipboard, viewing, new/add to, filter, tools, and reports.

The left sidebar contains a "Search | Browse" section and a "Navigator" section. The "Structure" tab is active, showing a tree view of the product structure. The tree view lists the following items:

Identity	Version	State
UNIV-1001, HYBRID RASR PAYLOAD, MEP, B.8 (As-Designed)	B.8 (As-Des...)	WIP
2E4450D01-000, TUBE, PAYLOAD, B.0 (As-Designed)	B.0 (As-Des...)	WIP
2E4451D01-000, PLATE, TOP, B.2 (As-Designed)	B.2 (As-Des...)	WIP
2E4451D01-M00, PLATE, TOP (MEMBER 1), B.0 (As-Designed)	B.0 (As-Des...)	WIP
ULTEM 1010, ULTEM 1010, A.1 (As-Designed)	A.1 (As-Des...)	WIP
MS51830A107, INSERT,.3125-18 UNJC-3B INT THD, A.9 (As-Designed)	A.9 (As-Des...)	REL
5A0543D01-000, SPAR, B.7 (As-Designed)	B.7 (As-Des...)	WIP
5A0848D01-000, ASSEMBLY, INSTRUMENTATION, A.4 (As-Designed)	A.4 (As-Des...)	WIP
5A0468D01-000, PLATE, TRANSITION, B.0 (As-Designed)	B.0 (As-Des...)	WIP
5A0469D01-000, STANDOFF, B.0 (As-Designed)	B.0 (As-Des...)	WIP
5A0469D01-M00, STANDOFF (MEMBER 1), B.0 (As-Designed)	B.0 (As-Des...)	WIP
MS51830-107, INSERT,.3125-18 UNJC-3B INT THD, A.9 (As-Designed)	A.9 (As-Des...)	REL
6K1200D01-000, BASE PLATE, B.1 (As-Designed)	B.1 (As-Des...)	WIP
6K1200, PLATE, BASE, B.2 (As-Designed)	B.2 (As-Des...)	WIP
93340A410, THREADED INSERT, LOCKING, STL, 250-20 UNC-2B X .37	A.2 (As-Des...)	REL
NAS1352-5-12, SCR,SCH,.3125-18UNRC-3A,.750 L, A.9 (As-Designed)	A.9 (As-Des...)	REL
9T9998D01-000, PLATE, DECK, B.2 (As-Designed)	B.2 (As-Des...)	WIP
9T9999D01-000, RING, SUPPORT HALF, B.2 (As-Designed)	B.2 (As-Des...)	WIP
AN960C8L, WASHER,.174ID,.375OD,.016THK, A.1 (As-Designed)	A.1 (As-Des...)	REL
NAS1352-08LL10, SCR,SCH,.1640-32UNRC-3A,.625 L, A.7 (As-Designed)	A.7 (As-Des...)	REL
NAS1352-08LL12, SCR,SCH,.1640-32UNRC-3A,.750 L, A.9 (As-Designed)	A.9 (As-Des...)	REL

The right sidebar contains a "Visualization" section with tabs for "Uses", "Occurrences", "Attributes", "Supersedes", and "Documents". The "Visualization" tab is active, showing a 3D model of the part. The model is rendered in a dark grey color with green highlights on the cylindrical features. The interface also includes a "Find in Structure" search bar and a "Zoom" section with various zooming options.

MAPR-4Ds Optimized Payload w/ Modular Experiment Platform – Rev B

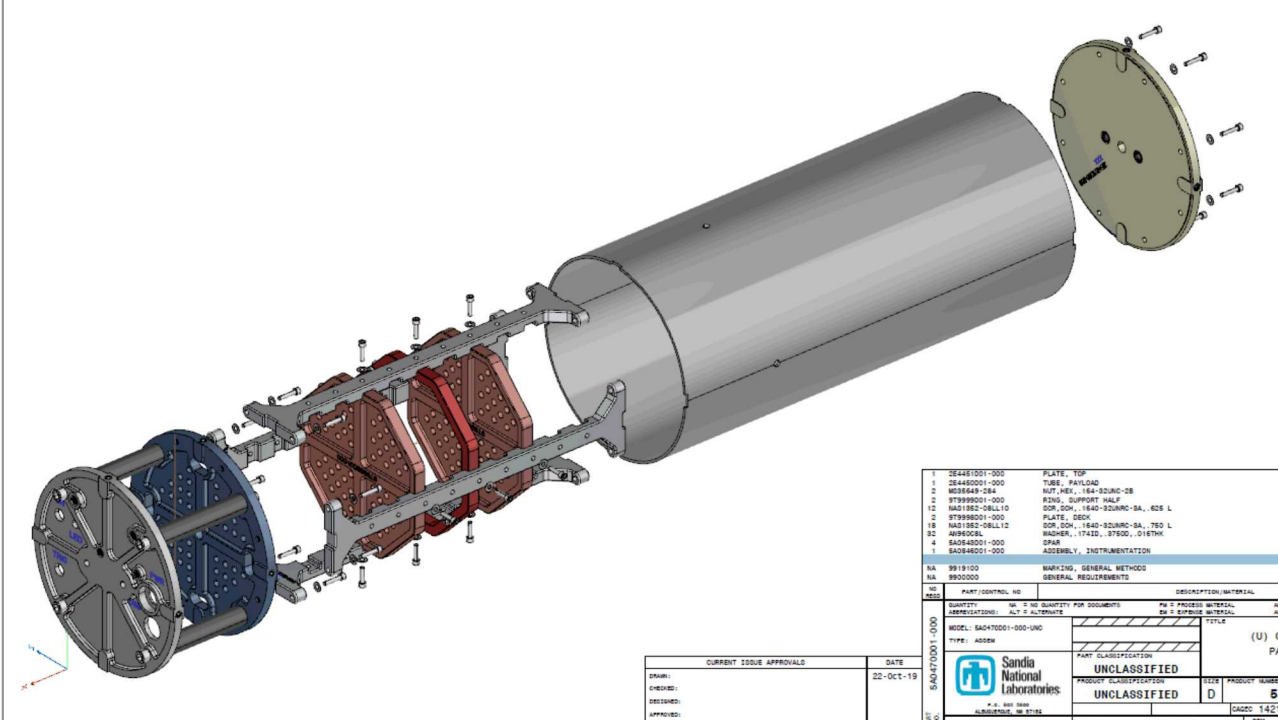
- Assembly 3DIV .pdf with Component Cross Highlighting

UNCLASSIFIED

PRESENTATION VIEWS (CLICK TO ACTIVATE) PRINT ALL VIEWS

0 MODEL
2 MGMT DATA
4 NOTES
7A EXPLODE
7B NO TUBE

VIEW 4 OF 5



UNCLASSIFIED

UNCLASSIFIED

Product Definition Baseline		REVISIONS	
Baseline Name:	IS:SA047001 OPTIMIZED RASR PAYLOAD, MEP, 2019-10-31 09:50:55 MDT	PART NUMBER:	5A047001-000
Baseline Number:	000000073	DESCRIPTION:	A PWB LINK CHANGE NOTICE - 14962
PCN Login Link:	PCN Login	DATE:	22-Oct-19
Baseline Link:	Baseline Link		

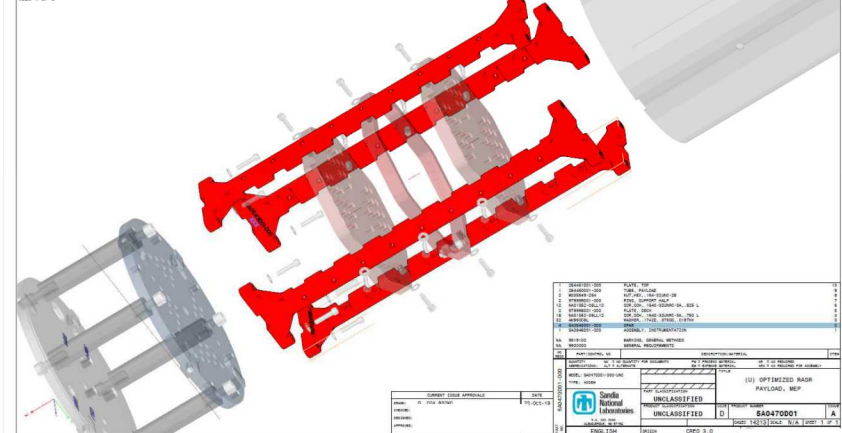
CHECKPLOT
DRAWING SUBJECT TO CHANGE
WITHOUT ISSUE CHANGE

UNCLASSIFIED

PRESENTATION VIEWS (CLICK TO ACTIVATE) PRINT ALL VIEWS

0 MODEL
2 MGMT DATA
4 NOTES
7A EXPLODE
7B NO TUBE

VIEW 4 OF 5



UNCLASSIFIED

Product Definition Baseline		REVISIONS	
Baseline Name:	IS:SA047001 OPTIMIZED RASR PAYLOAD, MEP, 2019-10-31 09:50:55 MDT	PART NUMBER:	5A047001-000
Baseline Number:	000000073	DESCRIPTION:	A PWB LINK CHANGE NOTICE - 14962
PCN Login Link:	PCN Login	DATE:	22-Oct-19
Baseline Link:	Baseline Link		

CHECKPLOT
DRAWING SUBJECT TO CHANGE
WITHOUT ISSUE CHANGE

REV	DESCRIPTION	DATE	BY
1	PLATE, TOP		
2	TUBE, PAYLOAD		
3	NUT, INCL. 1/4"-20UNC-2B		
4	RING, SUPPORT HALF		
5	SOP, SOH. 1/4"-20UNC-2A, 4CS L		
6	SOP, SOH. 1/4"-20UNC-2A, 4CS R		
7	PLATE, DECK		
8	SOP, SOH. 1/4"-20UNC-2A, 4CS L		
9	SOP, SOH. 1/4"-20UNC-2A, 4CS R		
10	WASHER, 1/4"-12, 316SS, 0.16THK		
11	SPIN		
12	ASSEMBLY, INSTRUMENTATION		

REV	DESCRIPTION	DATE	BY
NA	9919100 MARKING, GENERAL METHODS		
NA	9900000 GENERAL REQUIREMENTS		

MODEL: SA047001-000-UNC TYPE: ASSEM	TITLE: (U) OPTIMIZED RASR PAYLOAD, MEP	PART CLASSIFICATION: UNCLASSIFIED	SIZE: PRODUCT NUMBER: 5A047001 PRODUCT CLASSIFICATION: UNCLASSIFIED
Sandia National Laboratories	DATE: 22-OCT-19	CLASS: D	SHEET: 1 OF 1
ENGLISH	ORIGIN: CREO 3.0	SCALE: N/A	FROM STATUS: -19

MAPR-4Ds: Product Data Management

- Product Structure Development Approach Further Refined

- Material As “WTPart”
- Inseparable Assembly as:

- Product
 - Part Member
 - Insert

Inseparable assembly consumes Member and Insert

Member as callout to consuming assembly

Material assigned to member as WTPart

Insert as callout to consuming assembly

Member concept introduced to allow for material assignment at piece part level

Identity	Version	State
5A0543D01-000, SPAR, B.7 (As-Designed)	B.7 (As-Designed)	WIP
5A0543D01-M00, SPAR (MEMBER 1), B.5 (As-Designed)	B.5 (As-Designed)	WIP
ULTEM 1010, ULTEM 1010, A.1 (As-Designed)	A.1 (As-Designed)	WIP
5A0846D01-000, ASSEMBLY, INSTRUMENTATION, A.4 (As-Designed)	A.4 (As-Designed)	WIP
5A0468D01-000, PLATE, TRANSITION, B.0 (As-Designed)	B.0 (As-Designed)	WIP
5A0469D01-000, STANDOFF, B.0 (As-Designed)	B.0 (As-Designed)	WIP
5A0469D01-M00, STANDOFF (MEMBER 1), B.0 (As-Designed)	B.0 (As-Designed)	WIP
ULTEM 1010, ULTEM 1010, A.1 (As-Designed)	A.1 (As-Designed)	WIP
MS51830-107, INSERT, .3125-18 UNJC-3B INT THD, A.9 (As-Designed)	A.9 (As-Designed)	REL
6K1200D01-000, BASE PLATE, B.1 (As-Designed)	B.1 (As-Designed)	WIP
6K1200, PLATE, BASE, B.2 (As-Designed)	B.2 (As-Designed)	WIP
ULTEM 1010, ULTEM 1010, A.1 (As-Designed)	A.1 (As-Designed)	WIP
93340A410, THREADED INSERT, LOCKING, STL, .250-20 UNC-2B X .37	A.2 (As-Designed)	REL
NAS1352-5-12, SCR, SCH, .3125-18UNRC-3A, .750 L, A.9 (As-Designed)	A.9 (As-Designed)	REL
9T9998D01-000, PLATE, DECK, B.2 (As-Designed)	B.2 (As-Designed)	WIP
9T9999D01-000, RING, SUPPORT HALF, B.2 (As-Designed)	B.2 (As-Designed)	WIP
AND90C91, WASHER, 17/16, 3750D, 016TUK, A.1 (As-Designed)	A.1 (As-Designed)	REL

MAPR-4Ds: Product Data Management

- Material - Where Used
 - Once materials are added to the product structure, it's possible to quickly determine where materials are assigned in a given assembly and/or the stockpile

Piece parts in the UNIV-1001 Hybrid RASR Assembly using ULTEM 1010

Separate product using ULTEM 1010 in shared instrumentation assembly

Number	Version	Name
ULTEM 1010		ULTEM 1010
2E4451D01-M00	(As-Designed) B.0	PLATE, TOP (MEMBER 1)
9T9998D01-M00	(As-Designed) B.2	PLATE, DECK (MEMBER 1)
5A0468D01-M00	(As-Designed) B.1	PLATE, TRANSITION (MEMBER 1)
5A0468D01-000	(As-Designed) B.0	PLATE, TRANSITION
5A0846D01-000	(As-Designed) A.4	ASSEMBLY, INSTRUMENTATION
5A0470D01-000	(As-Designed) A.18	OPTIMIZED RASR PAYLOAD, MEP
UNIV-1001	(As-Designed) B.8	HYBRID RASR PAYLOAD, MEP
UNIV-1100	(As-Designed) A.1	ASSEMBLY, INSTRUMENTATION
5A0469D01-M00	(As-Designed) B.0	STANDOFF (MEMBER 1)
9T9999D01-M00	(As-Designed) B.2	RING, SUPPORT HALF (MEMBER 1)
5A0543D01-M00	(As-Designed) B.5	SPAR (MEMBER 1)

Assemblies consuming the piece parts using ULTEM 1010