Human Space Flight (HSF), Network Support Group (NSG) Presentation:

Nortel Router Replacement Project (NRRP) Status

March 21, 2011

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Team Members

- Nortel Router Replacement Project (NRRP) Team:
  - Project Manager: Chris Spinolo, NASA/NISN
  - Project Engineer: Scott Douglas, NASA/NISN
  - Project Lead: W. Bill Ihnat
  - Deputy Project Lead/Implementation Manager: Vince Turner
  - Mission Engineering: Chris Jermann, Andy Wells, Bryan Dixon, Jeff Bankert, Gary Schlueter
  - Mission Operations: Avis Nesbitt, Charles Rhys, Paul Hill
  - Mission Security: Rod Voisine
  - Transition Manager: Avis Nesbitt

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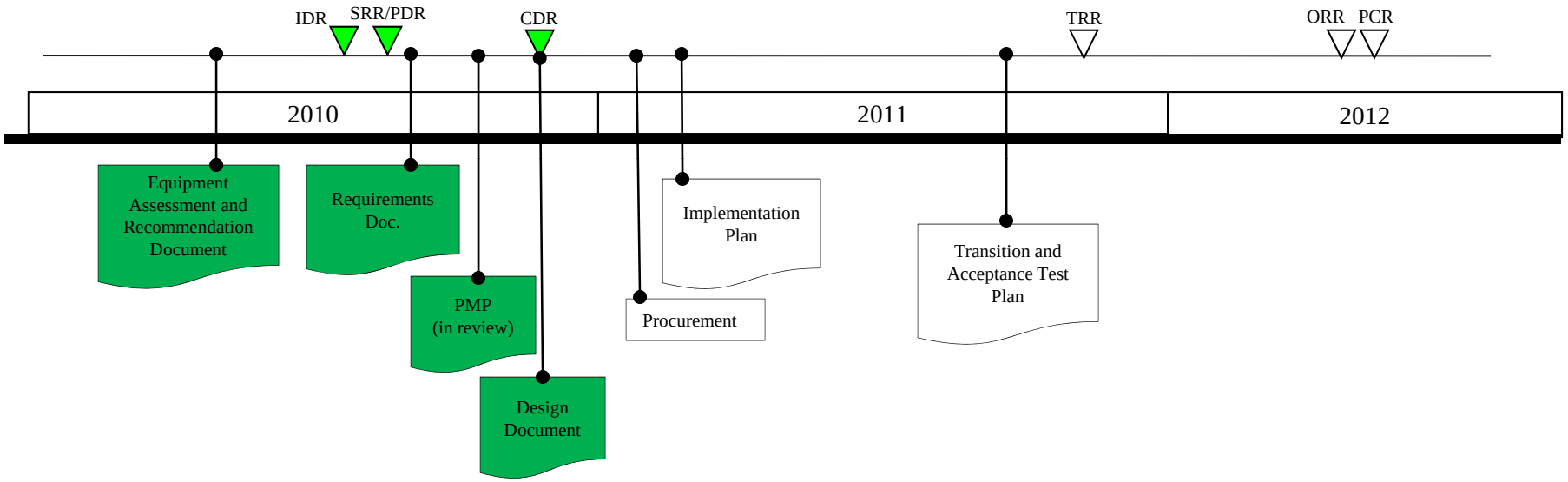
Development, Integration, and Test Plans and Procedures

Timeline of Deliverables



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NRRP Standing Review Board

- Chair : OCIO Project Executive for Communications, Betsy Edwards
- Members
  - Joseph Aquino, JSC
  - Luke Drury, JSC
  - Willard Peters, HQ
  - Michael Rodrigues, JPL
  - Russell Dare, GSFC
  - Scott Greatorex, GSFC

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Updated Baseline Documentation

- Baseline Documentation
  - Project Management Plan (PMP), vers. 0.43r1 (final draft in review)
  - Requirements Document, vers. 1.0 (approved/baseline)
  - Equipment Assessment and Recommendation, vers. 1.3 (approved/baseline)
  - Detailed Design, vers. 1.0 (approved/baseline)
  - Implementation Plan (draft approach/outline)
- Applicable Technical Plans – Proposed
  - Transition and Acceptance Testing Plan

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Product Build-to Specifications for Hardware and Software

- The Product Build-to Specifications for Hardware are defined in:
  - *Section IV: Technical and Network Performance Requirements* of the *NRRP Requirements Document (vers. 1.0, 08/06/10)*
  - *Section 2.5 Summary of Assessment Results* of the *Equipment Assessment and Recommendation for the NRRP (vers. 1.3, 10/19/10)*

- The NRRP is a wholly COTS implementation requiring no software development

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Development, Integration, and Test Plans and Procedures (cont.)

- The *Project Management Plan (PMP) for the NRRP* sets forth the oversight for design, development, integration and test activities required for the NRRP
- The *NRRP Requirements Document* is inclusive of all technical requirements for the NRRP
- The *Equipment Assessment and Recommendation for the NRRP* is inclusive of the test criteria, results and recommendation for the network devices to support implementation of the NRRP
- The *Internal Design Review (IDR) for the NRRP (09/28/09)* established the proposed, baseline configuration for design, implementation, and transition phases of the NRRP
- The *NRRP Detailed Design* sets forth the critical design and approach to be used for the Implementation Phase of the NRRP
- The *NRRP Implementation Plan (draft)* establishes the baseline, programmatic and technical approach to be used for the Implementation Phase of the NRRP

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Technical Data Package

- The *Equipment Assessment and Recommendation for the NRRP* is:
  - A technical description of each configuration item adequate for supporting an acquisition strategy
- The *NRRP Detailed Design* defines:
  - The required design configuration for the NRRP
  - Production and engineering schemas
- The *NRRP Detailed Design* consists of:
  - All applicable items such as drawings, associated lists, specifications, standards, performance requirements, quality assurance provisions, and packaging details

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Operational Limits and Constraints

- Programmatic
  - Mission Support Schedules, e.g., Human Space Flight (HSF) and Expendable Launch Vehicle (ELV) launches and support, Mission Freeze Periods impacts to the scheduling of implementation and transition activities
  - Host Center support to assist in implementation and transition activities
- Technical
  - Customer interfaces are existing, pre-defined and not amenable to modification to meet project requirements
  - NRRP must utilize industry best practice, COTS systems for design and implementation

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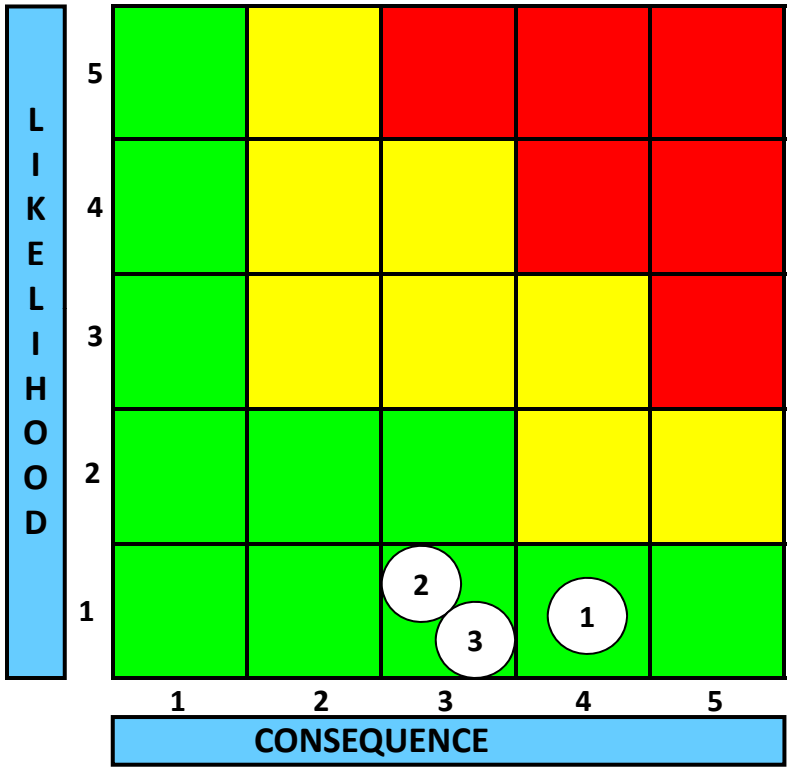
Risk Assessment and Mitigations



Rank/ Trend	Risk ID	Approach	Risk Statement
1	01	M	If Host Center Support is not available as needed to support implementation and transition activities then the scheduling and completion of these activities may be impacted
2	02	W	If we do not get adequate incumbent capture during NICS transition then the NRRP Project timeline may be impacted
3	03	M	If Nortel support ends prior to project completion date then mitigation needs to be enacted to provide remedial maintenance for existing routers
4	04	W	If CR persists then the availability of project funding may be impacted

Risk Summary

	Total	Accepted	M/W/R	Closed
High				
Med	1	1	0/1/0	0
Low	3	3	2/1/0	0

Criticality	L x C Trend	Approach
High	Decreasing (Improving)	M - Mitigate
Medium	Increasing (Worsening)	W - Watch
Low	Unchanged	A - Accept
	New Since Last Period	R - Research

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Details on Risk

Risk ID	Risk Statement	Mitigation Approach	CAT	L	C	Target Date for Risk Reduction	Status	Current Status/Risk Resolution
01	If Host Center Support is not available as needed to support implementation and transition activities then the scheduling and completion of these activities may be impacted	The Project Management Team will need to determine the availability of Host Center Support that will be needed during planning for this Project; Where Host Center Support is not available, a determination will need to be made as to how to leverage NISN technical support in its place	S	1	4	03/15/11	M	Communication enacted/on-going with each of the affected sites to determine local support, infrastructure and facilities requirements in addition to availability of HCS during implementation and transition phases of the project
02	If we do not get adequate incumbent capture during NICS transition then the NRRP Project timeline may be impacted	The Project Management Team will monitor the NICS contract award date, maintain a high level of integrity in their project documentation, and assess any indication that staffing may be reduced or that incumbent personnel may not transition to the new contract	S	1	3	Dependent on NICS Transition date	W	The Project Management Team is in a state of heightened awareness and will monitor the situation accordingly
03	If Nortel support ends prior to project completion date then mitigation needs to be enacted to provide remedial maintenance for existing routers	The Project Management Team will enact the *Concept of Operations for the NRRP – Risk Mitigation Strategy #1* that was approved in October, 2010	P	1	3	10/30/09	M	The *Concept of Operations for the NRRP – Risk Mitigation Strategy #1* was approved/has been in place since October, 2009
04	If CR persists then the availability of project funding may be impacted	The Service Executive for Communications, OCIO, NASA HQ will monitor CR and assess any impacts to this project	P	3	3	Dependent on CR	M	Preliminary funding for the NRRP received as of 03/24/11

Status	5x5 Risk Matrix	Category (CAT)
M- Mitigate	L-Likelihood	S - Schedule
W- Watch	C-Consequences	P - Programmatic
R- Research		T - Technical
C- Closed		

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Center Support

- Pre-Implementation
  - Allocate floor space, rack space, and power (as applicable)
    - Note: During transition phase host connections will be migrated to new NRRP switches. This may influence placement of NRRP equipment.
    - Redundant power sources are required
  - Ready network cables to support NRRP parallel network
    - Pending host site specific implementation plans
    - Interconnects between NRRP equipment
    - Provision analog phone lines (where applicable)
    - Extend WAN demarcs/cabling (as required)
    - Note: Host cabling to new switches will be needed to support transition phase

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Center Support (cont.)

- Implementation
  - Receive and house equipment
  - Install NRRP equipment
  - Cable NRRP equipment
  - Turn-up NRRP equipment
  - Facilitate NRRP member access to local facilities (where required)
  - Support NRRP implementation testing
  - NOTE: Host connections will not be migrated until transition phase

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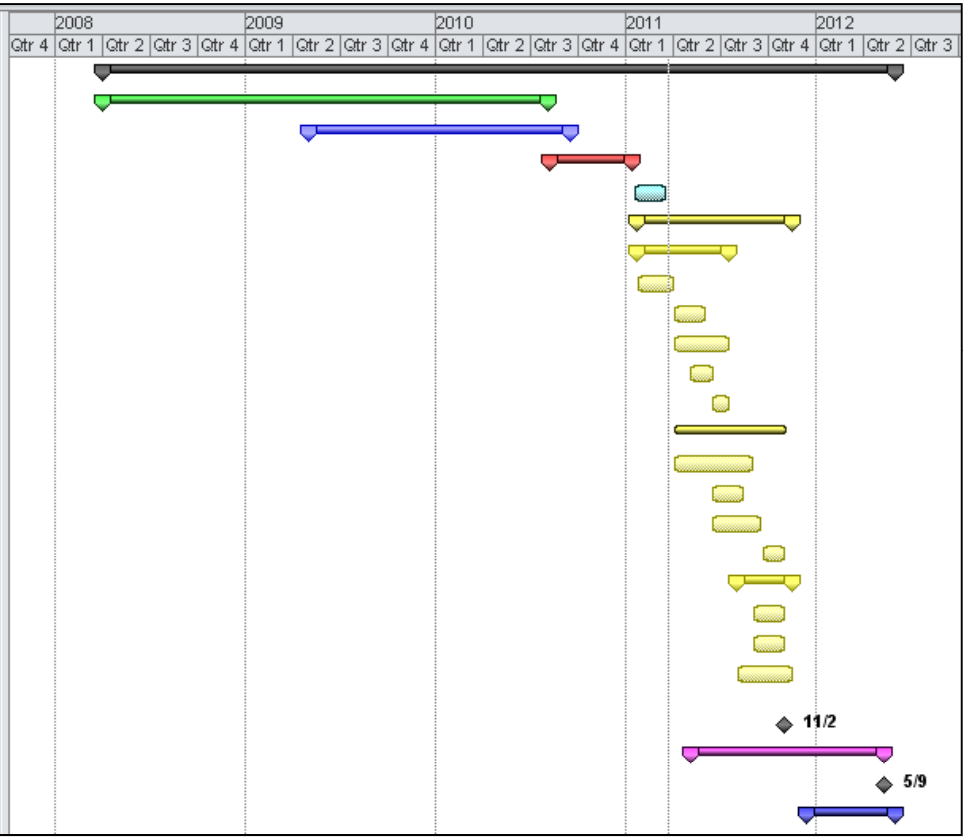
Updated Schedule

Task Name	Duration	Start	Finish
Nortel Router Replacement Project (NRRP)	**1087 days**	**Wed 4/2/08**	**Thu 5/31/12**
Project Planning	**611 days**	**Wed 4/2/08**	**Wed 8/4/10**
Requirements	**359 days**	**Fri 5/1/09**	**Wed 9/15/10**
Design Phase	**112 days**	**Mon 8/9/10**	**Wed 1/12/11**
Procurement	45 days	Mon 1/17/11	Fri 3/18/11
Implementation	**212 days**	**Fri 1/21/11**	**Mon 11/14/11**
Pre-Implementation Planning	**126 days**	**Fri 1/21/11**	**Fri 7/15/11**
Procurement Planning	51 days	Fri 1/21/11	Fri 4/1/11
Procurement "In cycle"	44 days	Fri 4/1/11	Wed 6/1/11
Infrastructure build-out/site preparation	76 days	Fri 4/1/11	Fri 7/15/11
NRRP equipment configuration and distribution	34 days	Tue 5/3/11	Fri 6/17/11
NRRP equipment receipt at affected sites	23 days	Wed 6/15/11	Fri 7/15/11
Implementation - Activities	**154 days**	**Fri 4/1/11**	**Wed 11/2/11**
WAN Augmentation/hook-up at affected sites	109 days	Fri 4/1/11	Wed 8/31/11
NRRP equipment installation at affected sites	43 days	Wed 6/15/11	Fri 8/12/11
NRRP equipment testing at affected sites	68 days	Wed 6/15/11	Fri 9/16/11
Implementation activity completion	31 days	Mon 9/19/11	Mon 10/31/11
Post-Implementaiton Activities	**76 days**	**Mon 8/1/11**	**Mon 11/14/11**
NISN Mission Operations training	44 days	Thu 9/1/11	Tue 11/1/11
Finalize implementation documentation	44 days	Thu 9/1/11	Tue 11/1/11
Real-time support of parallel network (Pre-Transition)	76 days	Mon 8/1/11	Mon 11/14/11
KDP-E	0 days	Wed 11/2/11	Wed 11/2/11
Transition	**265 days**	**Wed 5/4/11**	**Wed 5/9/12**
Transition Completion	0 days	Wed 5/9/12	Wed 5/9/12
Post-Transition	**124 days**	**Mon 12/12/11**	**Thu 5/31/12**



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Logistics

The NRRP will utilize in-place, remedial maintenance procedures for the distribution of equipment , parts and materials needed to support this project

- High-level overview of the project's logistical requirements (Ref. NRRP PMP, Sec. 1.5):

Element	Responsible Party	Activity or Action
Spares provisioning	NISN Mission Operations, Vendor	Ensure adequate spares are available to support standard Service Level Agreements (SLAs)
Shipping and handling of equipment	Procurement Team, NISN Mission Operations, NISN Mission Engineering and Project Implementation Lead	Ensure that the shipping and handling of all network based components is managed in conjunction with existing policies and procedures

- Equipment Receipt and Distribution (Ref. NRRP Requirements Doc., Sec. 5.7.5):
  - All required hardware shall be shipped to a pre-determined location at GSFC
  - Unless otherwise noted, all equipment shall be configured and staged for distribution at GSFC
  - NRRP equipment destined for sites remote to GSFC will be distributed from GSFC to affected sites
  - Host Center Support personnel will be tasked to receive all equipment shipped to their site

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Systems and Subsystem Certification Plans and Requirements

- The *Equipment Assessment and Recommendation for the NRRP* certifies COTS product selection
- The *NRRP Detailed Design* certifies the network architecture, implementation and transition approach
- The *NRRP Implementation Plan* certifies the successful completion of the NRRP replacement/parallel network as designed and implemented
- The *NRRP Transition and Acceptance Testing Plan* certifies the successful migration of customer interfaces from the legacy to the NRRP replacement/parallel network

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Conclusion

- CDR is Complete, with no open action items

Next steps:

- Procurement: 03/2011-06/2011
- Implementation Plan: 01/2011-05/2011
- Implementation: 04/2011-10/2011
- Transition Readiness Review (TRR): 11/2011
- Transition: 11/2011-04/2011
- Operations Readiness Review (ORR): 05/2012
- Project Completion Review (PCR): 05/2012
- Decommissioning Plan: 12/2011
- Decommissioning: 12/2011-05/2012
- Decommissioning Review (DR): 05/2012