National Patient Information Reporting System: National Data Warehouse

NDW Project Management

Plan

Version 2.0

November 2006

Department of Health and Human Services

Indian Health Service

Office of Information Technology (OIT)

Contents

Version Control

Version	Date	Notes
1.0	April 2005	Initial version.
2.0	November 2006	NDW-specific PM information

Executive Summary

The National Data Warehouse (NDW) project will upgrade the Indian Health Service's (IHS) national Data repository, the National Patient Information Reporting System (NPIRS), to a new, state-of-the-art, enterprise-wide data warehouse environment. The NDW will be developed to produce various reports that are required by statute and regulation and provide a broad range of clinical and administrative information to facilities, regional and national programs. The NDW will provide more accurate, timely, and a broader scope of information than was previously available to clinical and administrative managers throughout the Indian health system.

Information will be retrieved from the NDW via reports and ad hoc database searches from specialized data marts appropriate to authorized users' needs and access. Because of a data mart's relatively smaller size and simpler structure, search efficiency will be optimized and data can be readily available to authorized users.

Project Documents

The National Data Warehouse Project consists of the following documents required to manage the NDW program.

- A project charter, which is the authority to proceed with the stated objectives for the year ending October 2007.
- The roles and responsibility document outlines the personnel necessary for the project and what each team must accomplish.
- The scope document defines what is to be part of the project and what is not to be part of the project. It is followed by a scope management document so that there is an orderly process for changing the scope, if necessary. The scope management change plan is the details of how scope change must be managed.
- The risk management documents explain what possible foreseen and unforeseen risks attach to the project, and ways of managing project risk. There are other risk documents; a detailed risk management plan, a risk log, a risk mitigation strategy, and a contingency plan.
- The project communication management documents follow, including the project communication management plan.
- A program quality management document, which details the project standards.
- A testing management plan that outlines the testing required for the NDW project.

All of these documents detail what the project is, who is working in the project, what the project will accomplish, what is at risk and how will risk be managed, what will be communicated about the project and to whom, and the project standards to be adhered to.

The IHS management and the NDW project team must agree on the project scope, and this agreement will be in writing.

The NDW project planning documents, as a whole, constitute the NDW project as agreed to by IHS management and the NDW project manager, and this agreement shall be in writing. The **Error! Reference source not found.** is the written acceptance document for this project plan.

Project Charter

The NDW project has been approved and is underway. Therefore, this Project Charter section will only re-state the Project Purpose and Project Objectives previously established and approved, as well as the Project Governance.

Project Purpose

The purpose of the NDW project is to improve our ability to provide a broad range of retrospective clinical and administrative information to allow managers at all levels of the Indian health system to better manage individual patients, local facilities, and regional and national programs, and to allow IHS management to provide legislatively required reports to the Administration and Congress.

Project Objectives

- Provide the capability to produce reliable and timely reports and data sets to support IHS statutory, regulatory, and administrative obligations, including user population counts, workload reporting, accreditation, and GPRA performance measures.
- Improve the quality, timelines, and frequency of verified and published IHS data related to patient registration and health care encounters.
- Provide user accessibility to a comprehensive IHS healthcare database that will enable analysis and reporting of
  - Clinical practice patterns and episodes of care (diagnosis, treatment, wellness, prevention and screening services)
  - Measures of quality of care, clinical outcomes, disease management, prevention
  - Population-based epidemiological studies of disease states, medical histories, health behaviors, risk factors, and clinical outcomes
  - Specialized healthcare programs including diabetes, dental, public health nursing, alcohol & substance abuse
  - Patient demographics and healthcare utilization patterns
  - Data from which healthcare costs can be estimated for budget and resource planning
  - Utilization of alternative resources
- Provide relevant information (metadata) about the data it contains to enable end users to effectively leverage data resources for management decision-making and clinical research.

- Facilitate the standardization of export programs, source data file formats, and code values wherever possible to maximize data processing efficiency and data quality.
- Provide user accessibility through web-based technologies and end-user desktop applications.
- Protect community, tribal and facility confidentiality in accordance with negotiated agreements and understandings with IHS/Tribal/Urban (I/T/U) organizations.
- Protect individual privacy and security of health care data, in compliance with applicable privacy regulations and IHS policies.
- Provide feedback to suppliers of data regarding detection of critical and non-critical errors affecting data quality and completeness.
- Restore stakeholder confidence in IHS centralized data sources and increase user self-sufficiency in accessing and using IHS data.

Project Governance

- **Clear Lines of Authority**

  The NDW project manager is responsible to the IHS management for the successful completion of this project. The designated team leads report on this project to the project manager. The team members report to the team lead on this project. Any ancillary staff, whose knowledge, skills, and abilities may be requested to support this project, may be asked to participate as required.

- **Accountability**

  The NDW project manager is responsible for the successful completion of all approved tasks as defined in the baselined project plan, as amended during the project, following the formally established change management process. Each team lead is responsible for the successful completion of all approved tasks as defined in the baselined project plan, as amended during the project, following the formally established change management process.

- **Decision Processes**

  The NDW project manager will be responsible for making all decisions for tasks as approved by IHS Management as defined in the baselined project plan, as amended during the project, following the formally established change management process. Any material project decision, in the best judgment of the NDW project manager, outside the baselined project plan must be referred to the IHS management team.

- **Escalation Processes**

  Any decision made by the NDW project manager may be referred to the IHS management team, who will formally review the decision and ratify or amend it as required, and assign tasks as appropriate.

- **Levels of Delegation**

  The NDW project manager will delegate the completion of tasks to the team leads, who will delegate to the team members as appropriate.

- **Clear Definitions of the Hand-off Processes**

  This project is phased, and deliverables are outlined for the contract year ending 10/2007. As such, there can be no formal project closure, but all pertinent documentation will be completed and available to the IHS management team no later than the end of the contract year.

- This charter also establishes the signing authority for change control and contingency management processes.

Project Scope

In Scope

Upgrading the IHS National Patient Information Reporting System (NPIRS) to a new, state-of-the-art, enterprise-wide data warehouse environment.

The scope of the National Data Warehouse Iteration 1 phase specifically includes:

- Accept all the encounter and registration record based data elements (with a few additions) included in the most recent RPMS export to NPIRS and IHPES
- Create a highly normalized information model that accommodates all of these elements (so that it will be able to accept all entries in a multiple field, such as diagnoses, immunizations, ADA codes; rather than just an arbitrary, limited number, such as "the first 3")
- Implement the unique IDs for both registration and encounter records so that they can be accurately linked
- Implement a unified registration and encounter record export so that we minimize the chance the NDW will receive an encounter record without a registration record with which to link it
- Maintain historical snapshots of the state of registration and encounter records so that we can reproduce reports based on data in existence at some set point in the past
- Utilize the stated IHS Architecture for the RPMS export (and wherever possible, the non-RPMS exports) to the NDW including:
  - Utilize the industry standard HL7 format
  - Utilize an Interface Engine to route and reformat these exports
  - Implement appropriate security and privacy controls as required by HIPAA and Privacy Act regulations
- Enhance export tracking information to local exporting facilities and Areas
- Provide better tools to assure data integrity and report errors
- Produce all current and essential Agency reports including
- Workload and User Population reports

- Provide easy-to-use, readily available, search-efficient access for authorized users to appropriately configured clinical and administrative data, including standard reports and ad hoc access, using both web-based technologies and end-user desktop applications, appropriate user-specific access controls
- Pilot tools for assessing site-specific data quality; for example, assessing field content, variations in historical norms in the numbers of records received
- Design the system so that it can best accommodate future, as of yet unanticipated needs

Out of Scope

- Data elements not on the list provided on the National Data Warehouse web page at

  http://www.dw.ihs.gov/

  Examples of data elements not included in NDW Iteration 1:

  - All lab tests performed (only a limited subset will be exported to NDW Iteration 1)
  - Information associated with each Medication record other than what is specified, such as dosage strength and frequency, National Library of Medicine (NLM) clinical drug code (currently being developed)
  - All clinical measurements (only heights, weights, and blood pressures are being exported in NDW Iteration 1)
  - Certain registration-record-based clinical information such as: problem list diagnoses or conditions; history of surgery or procedures; allergies or adverse reactions; last occurrence of various measurements, immunizations, exams (unless any of the above are captured in an encounter record that falls within the range of the initial back load and subsequent exports)
    - A definitive method to unduplicate records of the same encounter that are received from multiple source systems (e.g., PCC versus the IHS Fiscal Intermediary)
    - Employee information
    - Equipment information
    - Billing information (costs, fees, billed amounts, paid amounts, etc.) - other than certain specified third party eligibility information
    - Cost accounting (specific costs for provided services) - other than estimates that can be derived from information already collected in NDW Iteration 1

- Data from outside sources such as Vital Statistics, Census, encounter data from Medicare and Medicaid (although pilot efforts are planned in NDW Iteration 1 to begin to look at some of these)
- A national level operational data store (ODS)

  ODS is another important type of national repository that complements, but is distinct from a data warehouse structure. In an ODS stored data is more volatile and real-time. An ODS stores the most current data rather than historical snapshots, and is more focused on ongoing, up-to-the-minute individual care, billing, and so forth, rather than retrospective analyses.
- A national level master person index (MPI)

  Although the NDW Iteration 1 phase will include functional components that usually are included in an MPI (e.g., probabilistic matching that unduplicates registration records to best approximate true "person" counts), it will not include key MPI functionality such as support for real-time queries and updates, rigorous manual review of possible matches.

However, many of the items denoted above as excluded from NDW Iteration 1 will be considered for future iterations of the NDW and/or separate but related national level projects, dependent on their user-determined priority and available resources.

Project Scope Management Plan

Any changes to scope must be reviewed by the project manager and IHS management team to ensure that it meets the project objectives and will result in a successful project. The project manager will be responsible for adhering to the scope of work.

Therefore, any modification to the original project scope of work, as baselined, will be considered as a change request. Requests must include:

- Benefits to be delivered
- Resource required to achieve timeline
- Scope of work and detail for each deliverable
- Project timing and milestone dates
- Project cost estimates

Any request to change the scope of the project or the content of a deliverable will be made in writing by the submission of a Scope Change Request Form (see Figure 3-2). Each change request will undergo a formal review before a decision to accept or reject the request.

Change requests will be submitted to the project manager. It will be logged on the Change Request Log, a copy of which is attached. It will be reviewed to determine the impact of the requested change. A formal written impact and recommendation by the NDW project manager will be completed. This will be submitted to the IHS management team for determination, along with the original request form, and any related documentation.

Project Scope Change Log

The NDW project will use an Excel spreadsheet to track all scope change requests. This log will include the following information:

- Scope change request, date of request and name of person submitting the request
- Date of review and recommendation
- Disposition of the request and date

National Data Warehouse Project Scope Change Log

	Scope Change Request	Date Requested	Person Submitting Request	Date of Review	Recommendation	Disposition Date	Disposition
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

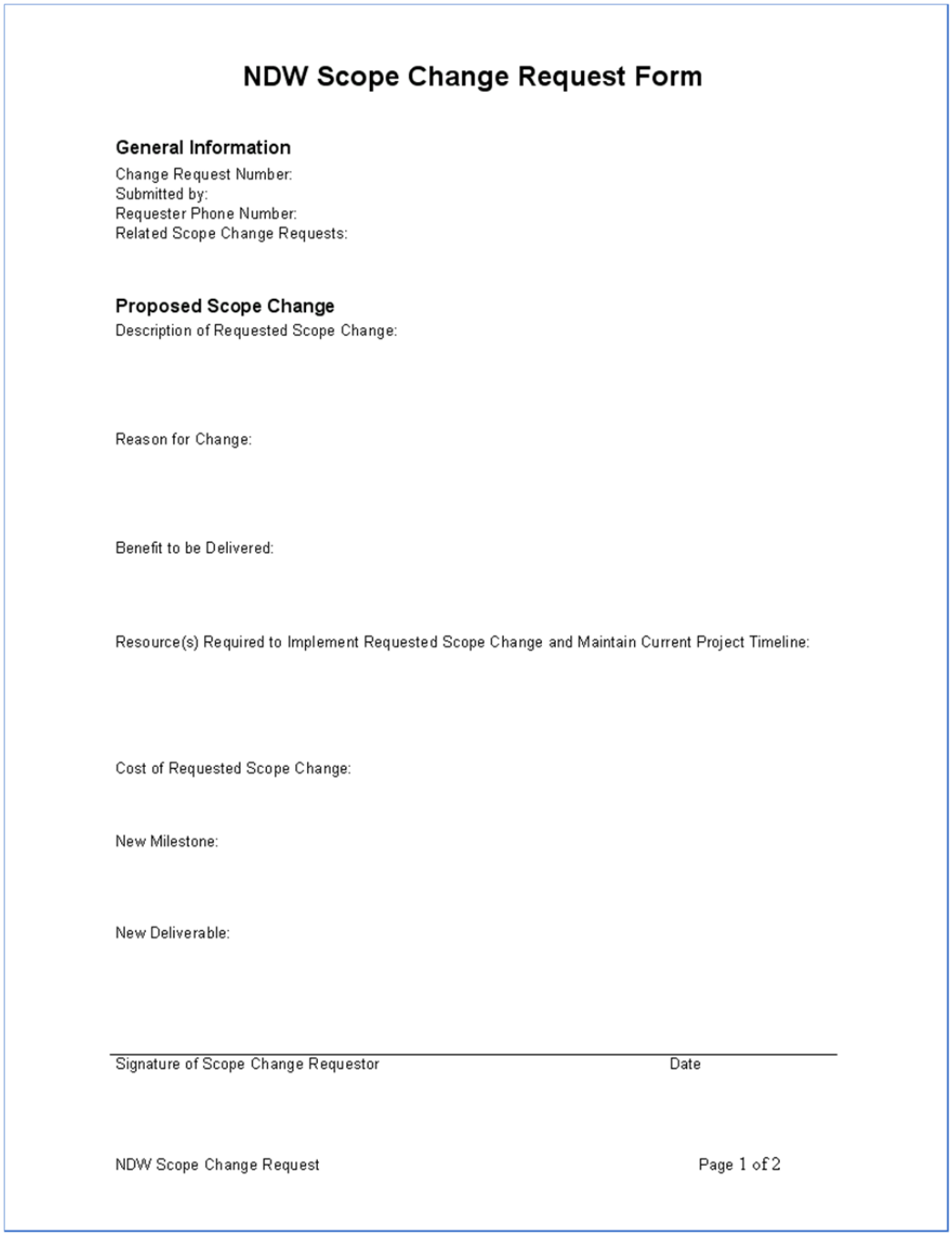
Figure 1.Example of NDW Project Scope Change Log

NDW Scope Change Request Form

The NDW Scope Change Request form has three sections:

- **General Information**, which is completed by the requestor, includes the tracking number, contact name and phone number, and any related scope change requests.
- **Proposed Scope Change**, which is completed by the requestor, includes a description and reason for the change request, benefit of the change, resources required and cost, new milestone and new deliverable
- **Approval Process** contains the recommendation and signature of the project manager and the disposition of the request and signature of IHS management.

An example of the scope change request form is on the following page.



NDW Scope Change Request Form

General Information

Change Request Number:
Submitted by:
Requester Phone Number:
Related Scope Change Requests:

Proposed Scope Change

Description of Requested Scope Change:

Reason for Change:

Benefit to be Delivered:

Resource(s) Required to Implement Requested Scope Change and Maintain Current Project Timeline:

Cost of Requested Scope Change:

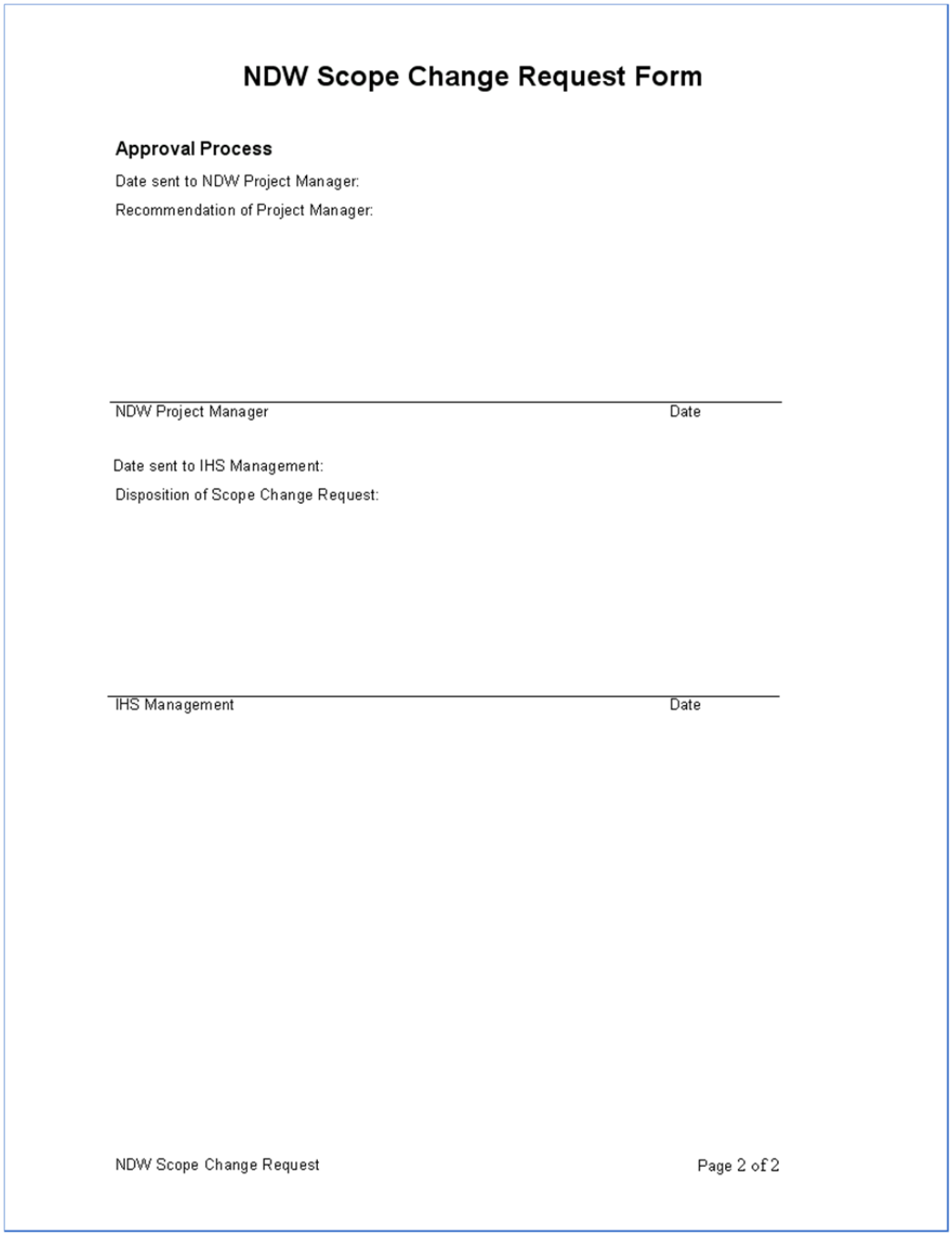
New Milestone:

New Deliverable:

Signature of Scope Change Requestor Date

NDW Scope Change Request Page 1 of 2

Figure 2. Example of NDW Scope Change Request Form (Page 1 of 2)



NDW Scope Change Request Form

Approval Process

Date sent to NDW Project Manager:

Recommendation of Project Manager:

NDW Project Manager Date

Date sent to IHS Management:

Disposition of Scope Change Request:

IHS Management Date

NDW Scope Change Request Page 2 of 2

Figure 3. Example of NDW Scope Change Request Form (Page 1 of 2)

Project Approach

The NDW is broken into deliverables that can be achieved throughout the course of the year ending 09/29/2007, the length of the current contract period. These deliverables were reviewed and approved by both IHS Management and CNI, the contracting vendor.

Project Deliverables

The list of these program deliverables along with descriptions, details, and dates can be found in the FY06 Contract. The following list includes the high-level deliverables agreed upon for the year ending 09/29/2007.

#	Deliverable
1.1	System Performance Reports
1.2	Control Reports for Data Loads
1.3	Special programming to load non-standard exports
1.4	Special Interface Engine programming
1.4.1	Non-standard exports to the NDW
1.4.2	Changes for the exports for the “Joslin Diabetes Center”
1.5	Export tracking e-mail reports
1.5.1	Receipt Acknowledgements
1.5.2	Post-Load Reports
1.6	Plan for facilitating the data mart loads
1.6.1	Draft Plan
1.6.2	Final Plan
1.7	Workload and User Population Reports
1.7.1	Final FY Workload Reports
1.7.2	Final FY User Pop Reports
1.7.3	Interim FY Workload Reports
1.7.4	Interim FY User Pop Reports
1.8	Other routine reports/data releases
1.9	Specially requested reports/data releases
1.10	Service Level Agreement(s) for the “General,” “Export Tracking and Error Reporting” and “Data Quality” data marts.
1.10.1	Draft SLA(s)
1.10.2	Final SLA(s)

#	Deliverable
1.11	Presentations, meeting handouts, technical documents, articles
1.12	Maintain and update components of the Metadata repository
1.12.1	Data elements descriptions
1.12.2	HL7 Implementation Guide
1.12.3	NDW database environment technical guide
1.12.4	NDW database logical and physical models
1.12.5	General Data Mart technical guide
1.12.6	Workload/User Pop Data Mart technical guide
1.12.7	Export Tracking/Error Reporting Data Mart technical guide
1.12.8	Data Quality Data Mart Technical Guide
1.12.9	NDW Database test environment
1.12.10	Data Marts test environment
1.13	Updates of NPIRS information in the IHS enterprise-level metadata registry
1.14	NPIRS informational web site
1.15	User manuals
1.15.1	Updates to the General Data Mart User Manual
1.15.2	Updates to the Workload/User Pop Data User Manual
1.15.3	Export Tracking/Error Reporting Data Mart User Manual
1.15.4	Data Quality Data Mart User Manual
1.16	General Data Mart User Training Course
1.16.1	General Data Mart user training course
1.16.2	Workload/User Pop Data Mart, Export Tracking/Error Reporting, and Data Quality Data Mart user training course
1.17	Service Level Agreement for the “Data marts test environment
1.17.1	Draft SLA(s)
1.17.2	Final SLA(s)
1.18	Security and Privacy Certification
1.18.1	Updates to the NPIRS C&A documentation
1.18.2	Updates to the NPIRS PIA
1.18.3	E-authorization controls
1.19	Security Incident Reports
1.20	Security Self-Assessments
1.21	Security weaknesses tracking
1.21.1	Security weaknesses tracking
1.21.2	Correction Plan for identified weaknesses

#	Deliverable
1.21.3	Implementation of corrections
1.22	System users' accounts verification
1.23	IHS COOP Plan
1.23.1	COOP Compliance reports
1.23.2	Updates to the IHS COOP Plan documentation
1.23.3	COOP post-exercise report
1.24	Minor enhancements to NDW environment
1.24.1	Technical documentation
1.25	CHS data validation reports
1.26	Implementation plan for retiring and archiving legacy NPIRS system
1.26.1	Draft
1.26.2	Final
1.27	Specified enhancements
1.27.1	Draft Business and Technical Requirements document
1.27.2	Final Business and Technical Requirements document
1.27.3	Draft Conceptual Design
1.27.4	Final Conceptual Design
1.27.5	Draft detailed Work Breakdown Schedule
1.27.6	Final Detailed Work Breakdown Schedule
1.28	Alternatives analysis for providing a data archiving system
1.29	Other enhancements
1.29.1	Draft Business and Technical Requirements document
1.29.2	Final Business and Technical Requirements document
1.29.3	Draft Conceptual Design
1.29.4	Final Conceptual Design
1.29.5	Draft Detailed Work Breakdown Schedule
1.29.6	Final Detailed Work Breakdown Schedule
1.30	Program Management Documents
1.30.1	Risk Management Plan
1.30.2	Risk Log
1.30.3	Quality Control Plan
1.30.4	Communication Plan
1.30.5	Change Management Plan
1.30.6	Draft technology refresh or life-cycle management plan
1.30.7	Final technology refresh or life-cycle management plan

#	Deliverable
1.30.8	System Performance Reports
1.30.9	Periodic problems/Issues reports
1.30.10	Operational Cost Reports
1.30.11	Draft reports for the HHS CPIC and OMB 53 and 300 processes
1.31	Project Management Documents
1.31.1	Risk Log
1.31.2	Draft Testing Plan
1.31.3	Final Testing Plan
1.31.4	Scope Change Documentation
1.31.5	Periodic progress reports
1.31.6	Periodic problems/issues reports
1.31.7	Earned-value reports
1.32	Contract Transition Support Plan
1.32.1	Draft
1.32.2	Final

Organization and Responsibilities

The structure and scope of the National Data Warehouse (NDW) program necessitates the need for role definition and corresponding responsibilities. The scope of this project is best represented by multiple teams and groups. These roles defined below have been developed to support the implementation of the National Data Warehouse Iteration 1 phase with the understanding that the team composition will be changed, or possibly reduced entirely, as tasks are completed.

NDW Program Manager

The NDW Program Manager is responsible for all program management policies and procedures, processes and infrastructure. This person will ensure that all communication about the project between the project team and the program flows through his oversight, and that the project work and team are functioning optimally. (Stan Griffith)

NDW Project Manager

The NDW Project Manager is responsible for following the IHS project management requirements approved for this project as defined in the baselined project plan and as amended during the project, following the formally established change management process. These include providing advice and assistance in enhancing project organization and documentation, in developing a transition plan for evolving from separate legacy and NDW systems to one NIPRS NDW system with an R&D component for NDW iteration 2 and beyond, and in assisting the Program Manager in developing better information for assessing current past costs and projecting future costs for annual OMB 300 reports for this investment.

NPIRS / NDW Technical Lead

The NDW Database Technical Lead is responsible for the successful completion of all approved data warehouse technical tasks and the successful completion of all approved Administrative Data Marts tasks as defined in the baselined project plan and as amended during the project, following the formally established change management process. These include:

- Managing the design, build, and implementation of the NDW Iteration 1 database and its associated structures
- Monitoring and assuring data integrity through the RPMS export process
- Producing or coordinating production of appropriate metadata in each of these realms
- Working with programs and users to gather their functional requirements
- Managing the design, build, and implementation of clinical data marts and their associated structures
- Managing the current NPIRS production system and managing the overall transition of production from that system to the new NPIRS NDW system

Security Lead

The Security Lead is responsible for the successful completion of all approved security tasks as defined in the baselined project plan and as amended during the project, following the formally established change management process. These include advising the NDW team about security requirements and the best ways to address them, and then monitoring their incorporation into the design and implementation of this system; and ensuring that Certification and Accreditation for this upgrade to the NPIRS system is completed and approved.

Change Control

Change control is a cross-functional process and can be related to project scope as well as operational processes. While changes during the operational portion of the project may be clear to conclude a final decision, scope changes may affect more than just the responsible project team, and therefore, may have a larger degree of impact, requiring further input from various stakeholders.

Change requests may be triggered by:

- Changes in business needs/requirements driven by project management or stakeholders
- Changes in the business environment (competitive actions, new technologies/processes)
- Problems or opportunities which occur during the course of the project
- Modifications or enhancements identified by the project team
- Faults detected by the project team or stakeholders

Change Control Process

The NDW Change Control Process consists of the following steps:

1. The Coordinator (the person assigned to the project, usually an analyst, who is responsible for coordination of the project) enters the project into TRAC (automated tracking system) and assigns a Project Name to the request. A specification for the project may also be created by the Coordinator, if needed.

Note: If a specification is required, the Coordinator may facilitate a peer review of the specification via e-mail or meeting.

---

2. The Coordinator fills out the necessary Task Order (TO) forms, attaches them to the TRAC system, and assigns them to the appropriate resources, based on direction from the Production Control team.

3. The Coordinator drafts the Test Plan. (Depending upon complexity of change, this may be incorporated directly into the Task Order, or prepared as a separate document.)

4. Each resource assigned to a TO works on his/her task(s) in the development environment until the task is ready to move to the test environment. All tasks are unit tested by the resource in the development environment.

Note: During the development stage of a task, it is possible and likely that changes to the original task order will be made. These changes will be documented within the task order (upon approval), as well as within TRAC.

5. Implementation instructions are written by the resources assigned to each of the Change Management Requests (CMRs), and are forwarded to the Coordinator. These instructions should include the library where revised code resides as well as the method by which the new code will be implemented into the production system. For the DBA, the method by which any database structure changes will be moved should also be documented.

6. The Coordinator incorporates the implementation instructions for this project into the task order.

7. The Coordinator creates a draft version of the Release Notes for the project.

8. A Production Control team meeting is scheduled to approve moving forward with the proposed task order changes into the test environment. Any coordination of other enhancements will be addressed by the team as well, including the version release schedule.

9. When Integration Testing has been successfully completed, the Coordinator(s) generates the Production Implementation Change Management Request (CMR), which is sent to the Production Control team. This CMR includes the implementation instructions as given by the task assignee.

10. The Production Control Team will approve the results, and schedule the move to the production environment. Affected parties will be notified of any system downtime, appropriate back-ups will be generated, and restrictions will be placed on the database to avoid any system contention or illegitimate updates.

11. The Coordinator will update the Implementation Plan and Release Notes as needed for the production environment.

12. The Coordinator will confirm the production implementation was successful by testing in the new production environment. Any discrepancies or issues will be reviewed by the Production Control team prior to lifting restrictions on the database and allowing normal processing to continue.

13. The Coordinator distributes the Release Notes, completes the Project Tracking form, places documentation in the appropriate file directories, and the project is closed.

Risk Management

Project management requires the planning of milestones and activities, and the identification and allocation of resources to carry them out. Risk management looks at those factors that threaten to stop the planned activities from being carried out and prevent milestones from being achieved. The technique seeks to anticipate problems and pre-plan, whenever possible, ways of reducing their probability of occurrence and/or mitigating their impact should they occur. The alternative to this is crisis management and reactive problem resolution.

Issues, Risks, and Mitigating Factors

These are the identified issues / risks, the likelihood that they will occur, the probable impact (High, Medium, Low), and the associated mitigation plan.

Risk severity is generally evaluated as low, medium, and high, balancing the impact of the risk with the probability of the risk, as the following figure illustrates.

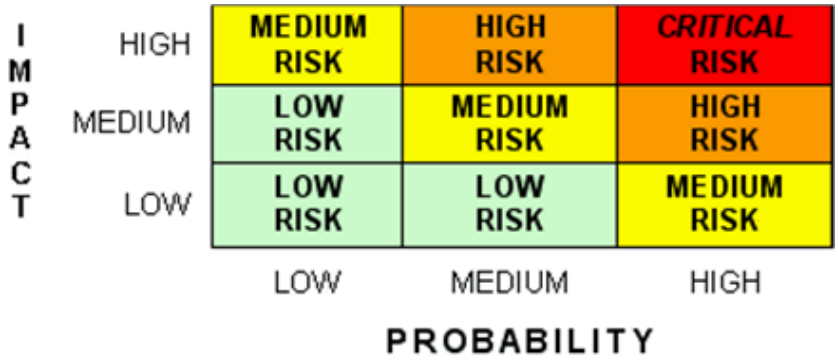


Figure 4. Risk - Impact Probability Matrix

Monitoring Risks

Risk monitoring is an iterative process that will be performed throughout the entirety of the NDW project. It is expected that the NDW Project Manager will be performing this task and reporting to IHS Management on a continual basis using the following strategy:

- Identifying Risks
- Assessing and Prioritizing Risks
- Eliminating, Accepting or Reducing Risks, including Contingency Planning
- Tracking and Reviewing Risks

The risks will be routinely monitored by IHS Management.

Communication Management

The status of the NDW project must be communicated effectively and at regular intervals. The NDW project manager is responsible for project communications. A number of project communications will be directed to different audiences.

Examples of the types of communications that flow across the project include:

- **Weekly Project Meetings** – These will be divided up into a software development team meeting, a training team meeting, an infrastructure team, a network team, a documentation team meeting, a clinical advisory team meeting for the alpha and beta sites. Other peer-to-peer meeting may be scheduled as the need arises. Vendors of goods and services may be asked to join specific meetings as need arises.
- **Meeting minutes** – from team meetings, IHS management meetings, project meetings
- **Emails** that pertain to this project
- **Shared information on the IHS network** – The NDW project has a shared folder on the P drive, and all communications documents and other project information will be placed and can be found there.
- **IHS/NDW website** – This contains a great deal of information and will be an excellent vehicle for communication of general project information to stakeholders.

Communication Management Plan

The NDW project has a wide variety of stakeholders with many different requirements for information about this project. The NDW project contains many and varied stakeholder groups, from software developers to physicians, to patients. The communication management plan is to establish a way of distributing project information to project stakeholders.

A major part of the goal of the communications management plan is to set a level of expectations so that any change required by the project, when it comes, is what was anticipated. Therefore, as soon as information about the required changes is understood, the project manager must work with the site liaison, the project clinical team lead, the site training manager and the targeted staff at the site to be certain that the staff is fully aware of the pending changes. This must include both changes that will have a positive impact and changes that will have a negative impact.

The NDW project will communicate among the project team members and to interested stakeholders as follows:

- The project team leads will be communicating formally through a bi-weekly project meeting. This call will have formal minutes that will be available to the team and other interested stakeholders.
- The project has a folder in a shared directory, which will contain information about this project. The information in this folder is intended for the project team and other interested stakeholders.
- Informal meetings, phone calls, and email will also be used to keep the project team informed about the project.
- Periodic status reports will be sent to IHS senior management and other interested stakeholders.
- A publicly available website will be set up containing information about this project and product.

The following information will be summarized and reported to produce the communication outputs that will fulfill the program requirements.

Information Requirement	To whom?	Frequency	Reporting / Documentation Method	Report / Document Title
System Performance for NDW and Marts	Stan Griffith	Monthly	EXCEL spreadsheet	Monthly System Performance
General Mart System / Structure Updates	IHPES	As needed	Release Notes	"NDW Release Notes" with date
Change Management: Scope Changes	Stan Griffith, NDW Team	As needed.	Formal Scope Change Request	
Change Management Requests	NDW Team	As needed.	Task Order entered into TRAC.	TRAC Ticket # as assigned.
Risk Management updates	Stan Griffith, NDW Team	As needed.	Update of Risk Management worksheet.	"Risk Management Worksheet" with date.
Program Progress	Stan Griffith	Weekly	Meeting	N/A
Program Deliverables	Stan Griffith	Monthly	Monthly updates via e-mail, informal document.	N/A

Ultimate responsibility for communication management planning will be the project manager. The project manager is responsible for formal communication about the project. The IHS management team reviews and approves formal communication about the project.

Quality Management

The IHS National Data Warehouse and associated data marts, as well as their associated infrastructure, network, hardware, and software requirements, will be measured by the existing IHS standards currently in place. There are no specific exemptions to those requirements governing this project.

The purpose of this Quality Management Plan is to establish the goals, processes, and responsibilities required to implement the NDW plan deliverables for FY2007. This will include the specific activities conducted to ensure that project and program activities are developed and accomplished in accordance with IHS and industry-standard methodologies, standards, and procedures.

Quality Objectives

This Quality Management Plan applies to all system development and maintenance efforts, and has the following objectives:

1. Deliver products and services that meet customer needs and business objectives.

2. Prevent and resolve problems by implementing effective and "best practice" work processes.

3. Promote continuous improvement in work processes to improve quality, timeliness, and cost-effectiveness.

The NDW project manager will undertake quality reviews of key deliverables to ensure compliance with IHS standards, as well as to ensure that IHS process standards are followed to minimize the possibility of poor quality with the project process and associated deliverables.

Quality Assurance and Quality Control

Quality assurance and quality control differ in the following manner:

Quality Assurance involves ensuring that all NDW project management are appropriate and are being used in a consistent manner.

Quality Control involves ensuring that the quality of the NDW project deliverables and processes are of high quality and acceptable to the stakeholders.

Quality Assurance

The NDW project manager will clearly define and document quality assurance procedures. This will include:

- Personnel responsible for key deliverables
- Acceptance and approval by the IHS management team
- Maintenance and version control on deliverables
- Review and sign off procedures
- Actions to be taken if the project or its tasks can not be completed within timescales of the approved project plan

Quality Control

Quality Control is broadly involved with the quality of the deliverable and ways of working in order to deliver the NDW project to the IHS standards. The quality control in place is described below.

Quality Management Responsibility

The quality management plan defines how the IHS quality policy will be implemented in the NDW project. If such a standard plan does not exist, the NDW project manager must ensure that an appropriate quality management plan is developed for the project. This would include:

- Project quality policy and objectives, including technical and non-technical aspects
- Internal and external standards, guidelines, practices, naming conventions, etc. to be used on the NDW project
- Strategy for assignment of qualified project staff

- Product requirements traceability technique to be adopted
- Project metrics to be collected and internal/external quality audits to be performed
- Change control strategy to be adopted
- Project quality improvement strategy

To ensure that a consistent quality assurance and control approach is used throughout the NDW project, the quality plan will reference the management processes that will be utilized on the project. These processes will remain constant throughout the life of the NDW project.

Quality Management Plan

The intent of the project quality management plan is to provide reassurance to project stakeholders that the NDW project is being proactively managed and will achieve its objective. It is also intended to add value to the project by enabling the project to achieve a higher quality result, or more effective use of resources, or both.

The approach for managing quality includes the quality plan and the following three major processes:

- Completeness and correctness criteria
- Quality assurance
- Quality control

The tools used to monitor project quality will be those required by the Indian Health Service for this purpose. Where tools for managing quality do not exist, this project will propose any tools to be used, if required.

Completeness and Correctness Criteria

The NDW project deliverables will follow the IHS standards regarding the completeness and correctness of project deliverables. Where such standards do not exist, the project will follow generally accepted project management industry standards. The reaching of a milestone in the project will be marked by a deliverable as defined by the IHS management and the NDW project manager.

The NDW project manager and IHS management have set forth deliverables for the upcoming contract year 2007 (see “Deliverables”, this document). The Project Sponsor, NDW Project Manager, and NPIRS Team Lead will work together to ensure deliverables are complete in scope and follow the conceptual design and/or design criteria.

Quality Assurance

Quality assurance for the NDW project will follow IHS standards for projects; absent standards for this sort of project, the NDW project will follow generally accepted project management industry standards.

The NDW Project has included the following quality assurance activities in the project work plan that will include quality assurance procedures for the NDW project will follow IHS standards for projects; absent standards for this sort of project, the NDW project will follow generally accepted project management industry standards. These include, but are not limited to:

- Maintain awareness of the project product and service quality by monitoring progress.
- Provide IHS management with the necessary visibility of the processes used in the project performance (e.g., System Performance reports, functional specifications, etc.).
- Notify IHS management regarding potential quality-related issues.
- Recommendations regarding policies, methodology, processes, procedures, and standards for optimal performance.
- Review of project deliverables and review of project documentation.
- Monitor project activities for compliance with policies, processes and procedures.

Quality Assurance Roles and Responsibilities

The following table summarizes quality assurance roles and responsibilities:

Role	QA Responsibilities
NDW Project Manager	Responsible for following IHS quality management standards, and generally accepted project management industry standards where IHS quality management standards are silent.
IHS Management	Responsible for review and acceptance of the quality management standards for this project
NDW Project team members	Responsible for adhering to the quality management standards for the NDW project.

Quality Control

This process will verify that NDW project deliverables meet the quality standards established for this project.

Quality Control Procedures

The NDW Project has included quality control activities in the project work plan for verifying the deliverable of this project meet the quality standards for this project. Specifically, all IHS and generally accepted project management industry standards will be used, including but not limited to

- A system development lifecycle (SDLC)
- The preparation of functional and technical specifications
- Peer Review (design and code phases)
- A formalized Change Management Process, including tracking and reporting
- Conceptual design documents (as required)
- Unit and integrated testing
- User Guides (as required)
- Release notes
- Training (as required)

Data Change Requests

The NDW project verifies that the data that has been received is what was sent, and that what was loaded into the NDW was what was sent. However, under certain circumstances, data may need to be changed to maintain the integrity of the system. When this need arises, a formal request must be submitted and approved by IHS Management. See Appendix A for the form used to have these requests approved.

Quality control roles and responsibilities

The following table summarizes quality control roles and responsibilities:

Role	QC Responsibilities
NDW Project Manager	Responsible for assuring that the NDW Project deliverables adhere to the quality standards for this project.
IHS Management	Responsible for accepting only NDW project deliverables that adhere to the quality standards for this project.
NDW Project team members	Responsible for adhering to the quality control standards for this project.

Quality Operating Procedures Process

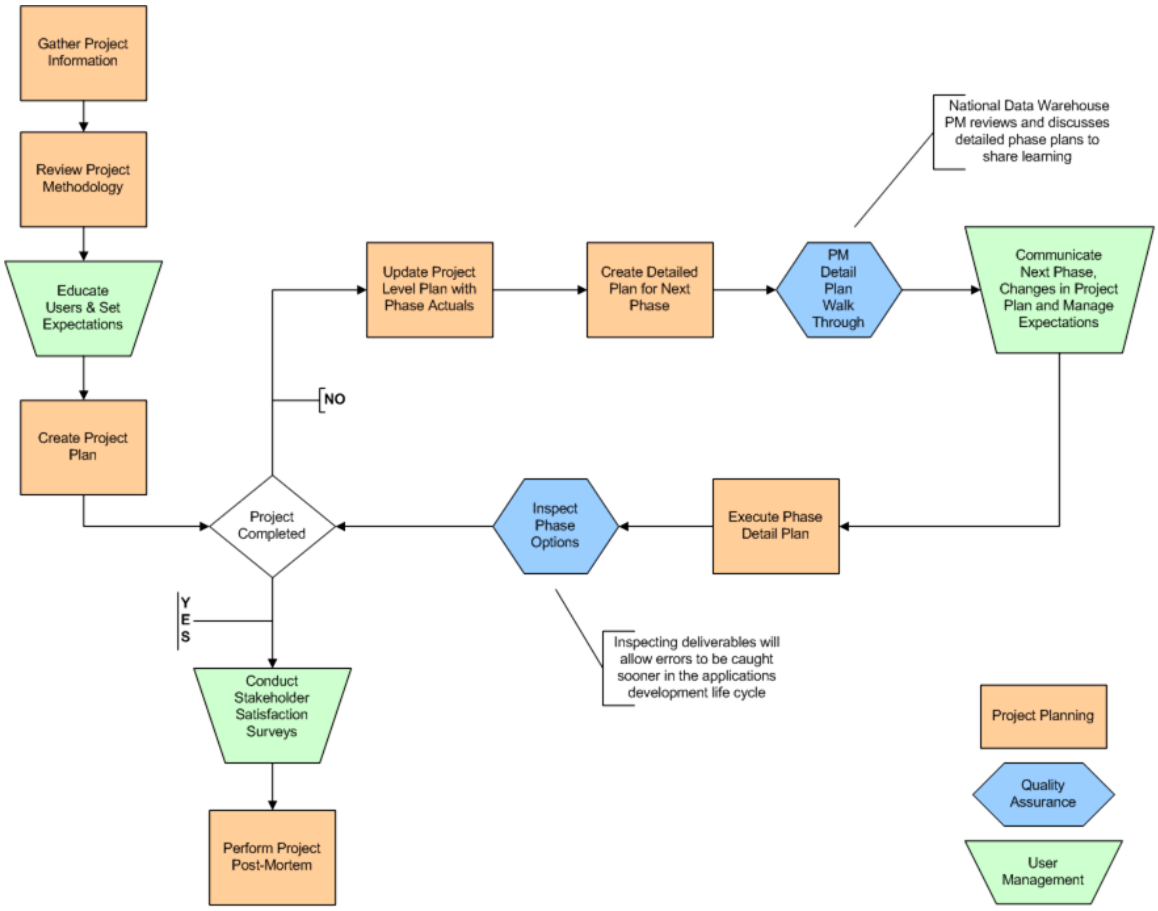


Figure 5. Quality Operating Procedures Process

Testing Management

The NDW project has a testing requirement to ensure that the National Data Warehouse contains the correct and appropriate information and can be used as the replacement for the current National Patient Information Reporting System (NPIRS). There will be more information in the replacement system than in the old, so it must be verified that the additional information is also correct and appropriate.

It is not the intent of this project to test the veracity of the information. The information comes from various sources, and it is up to the source system to determine data validity. However, the NDW project must verify that the information that has been received is what was sent, and that what was loaded into the NDW was what was sent. There may be variations in field length made to accommodate a longer entry received from one facility than received from another, but the entry should not be changed. This does in no way mean that the data is necessarily accurate.

The NDW project also includes testing new data processing applications, as well as changes needed to accommodate varying file formats and anomalous data. This testing will follow the industry-standard methodology.

- Unit Testing – The first testing is to ensure that the component meets expectations in terms of features and functionality. In almost all cases, the person that develops the component also does unit testing.
- Integration Testing – After the components have been unit tested, they are executed together. This testing verifies that the interfaces work correctly and that data is processed in its entirety as expected.
- System Testing – This is where the most rigorous testing takes place, to ensure that the solution meets the technical and environmental needs of the customer and that the solution behaves as it should. Many individual tests can be performed under the system test umbrella. These include stress testing, usability testing, security testing, performance testing, recovery testing, and multi-site testing.
- Acceptance Testing – This is the final set of tests to ensure that the solution meets the business objectives and requirements. The business customers may be responsible for this testing. It requires their active participation to work with the solution, as they will when it moves to production status.

Test Management Plan

The goal of the test management plan is to be certain that appropriate and rigorous testing is accomplished prior to the implementation of NDW as the current NPIRS replacement. The testing strategy will follow all current IHS methodologies and standards required for testing associated with creating data repositories, including any HIPAA requirements as may apply to the safeguarding of patient information.

The test plan will identify the staff creating the testing materials, designing the format and performing the testing. It will identify, by function, if not by name, all staff validating the testing of the product during the implementation, and the expected timeframe in which testing will be done.

The validated extraction and load programs will be placed in a code library and be made available for the creation of any subsequent testing.

Test Plan documentation will include the following:

- Person Responsible – Defines the person or group responsible for the testing.
- Person(s) Approving – Defines the person(s) or organization responsible for approving the testing and for validating that the solution is ready to be moved to the next level of testing.
- Test Environment – Describes any noteworthy features of the test environment, including location, equipment needed, software or tools used.
- Testing Process and Validation – Describes the testing logistics in some detail. This includes the types of tests to be performed, what is to be validated, the success criteria, error and exception handling, the retesting process.

Additional testing documentation will describe the testing methodology; including a detailed description of any specific methodology or standards that will make clear the rationale behind each part of the testing plan.

Test plan documentation will include any testing metrics associated with this testing. This will describe any metrics captured as part of the testing process, such as total components tested, total defects per testing event, average time for defect correction, total number of hours spent on testing, total cost of testing.

Test plan documentation will also include

- Detailed testing assumptions that explain more about the testing process and results.
- Designated testing staff or project team member, who will sign for successful testing, verifying that the results of testing are acceptable.

NDW Project Management Plan Signature Page

This signature page represents the acceptance of these documents as the project plan. In signing this document all parties agree the project will adhere to this project plan. More detailed planning documentation will delivered for this project and will consist of all required project plan deliverables.

Stanley P. Griffith, MD, FAAFP — Date
Manager, IHS National Data Warehouse Project

Paul Golis — Date
National Data Warehouse / NPIRS Task Lead

Appendix A: Production Data Change Form

PRODUCTION DATA CHANGE
Must be approved by Program Manager

Control Number (NPIRS use)

Brief Title	

REQUEST

Requester's Name	**Organization**	**Title**	**Date**

Problem Description (Define the change being requested. Provide all relevant documentation and requirements.)
Change (Describe the actual change that will be done)
Reason for Change (Define the reason for the change and the expectations for the change.)

COMMENTS

NPIRS Clarification of Impact (Define the impact of the change being requested – if applicable.)

APPROVAL

Program Manager's Name	**Date**

Program Manager's Decision (Indicate the decision concerning the requested change. Provide relevant limitations and/or scope.)