

NATIONAL WEATHER SERVICE INSTRUCTION 10-103

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Operations and Services

NWS Requirements, Operations and Services Improvements, NWSPD 10-1

OPERATIONS AND SERVICES IMPROVEMENT PROCESS IMPLEMENTATION

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SUMMARY OF REVISIONS: This directive supersedes NWS Instruction 10-103, dated June 14, 2007. Changes include: (1) Replacement of the NWS Corporate Board committees with the OSIP Executive Oversight Committee, (2) Gate approval based on full consensus, (3) Virtual Gate meetings and, (3) A note in the appendices indicating that not all documents may be necessary in a given stage for a project.

signed

July 8, 2010

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Date

Director, Office of Climate, Water,
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Operations and Services Improvement Process Implementation

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Operations and Services Improvement Process (OSIP) Implementation

1. Introduction. OSIP is the NWS corporate requirements-based management process for evaluating needs and opportunities and providing management information for making decisions to improve operations and services. OSIP is used to:
 - Define and validate needs and opportunities for developing and implementing responsive, scientifically and technically sound, secure, and cost-effective solutions;
 - Ensure the developed products or services are responsive to user requirements, including the transition from research to operations;
 - Act as a central repository for research and development projects and when appropriate, re-direct projects into the most appropriate pre-existing NWS implementation process (e.g., Software Recommendation and Evaluation Committee, Configuration Control Boards, NCEP Launch process, Data Review Group, etc.); and
 - Manage NWS Operational Requirements and related documentation.

OSIP is necessary to meet the National Weather Service (NWS) demands to improve operations and services in a transparent and corporate-wide manner. Operational and service improvements are motivated by user-needs and advances in science and technology that are necessary to move the NWS through the 21st Century. This instruction defines the organizational, management, and procedural framework for the NWS OSIP.

2. Purpose and Scope. This instruction provides information on implementing a formal and consistent management process based on requirements. This instruction describes the implementation of OSIP processes, activities, and deliverables in five stages and four Gates (key decision points) which make up OSIP (see Figure 1 below). A general description of each stage is presented in Section 3 below. Further detail for the process for each stage is described in the appendices.

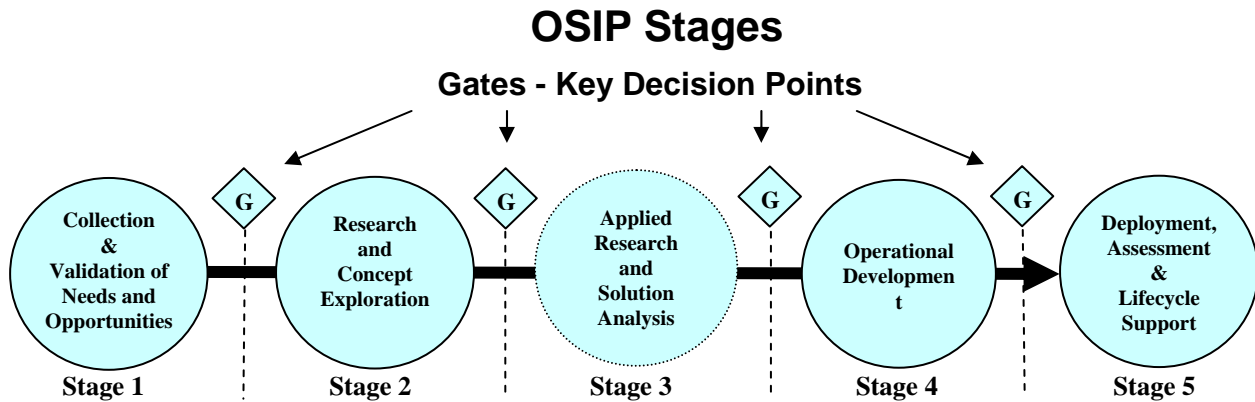


Figure 1. The five stages of the Operations and Services Improvement Process

The OSIP goals are to:

- a. Better meet user expectations and satisfy high priority mission and user needs.
- b. Improve coordination and communication among NWS Financial Management Centers (FMCs) and other organizations involved in the end-to-end process of improving NWS operations and services.
- c. Provide a common NWS-wide mechanism to document and decompose requirements to the appropriate detailed level to ensure the detailed definition of “what” is to be developed is complete and accepted before it actually is developed thereby eliminating costly rework (fixing items which did not meet the user’s expectation).
- d. Ensure corporate review and implementation of enterprise-wide solutions.
- e. Provide requirements management for the NWS.
- f. Identify and mitigate risks to cost, schedule, and performance.
- g. Align the information to be used with existing processes for Change Management, the Program, Planning, Budgeting and Execution System (PPBES), NOAA’s Requirements Management Process, and NOAA Transition from Research to Applications Policy (NAO 216-105).

Projects in OSIP may be redirected at any Gate to other appropriate processes such as a Configuration Control Board (CCB), the Data Review Group, NWS New or Enhanced Products Process, Software Recommendation and Evaluation Committee (SREC), or other established process such as the National Centers for Environmental Prediction’s Model Improvement Process, Aviation Weather Technology Transfer (AWTT) process, or Hydrologic Operations & Service Improvement Process (HOSIP). The re-direct applies if the project falls under the purview of the process or committee and the required information and resources are available. Consideration is made at the Gates to reduce the number of separate processes through which projects proceed to complete implementation, avoiding redundant documentation and/or oversight.

Projects originating in these processes may be forwarded to OSIP if requirement validation, analysis, development or design efforts and coordination are necessary.

3. OSIP Execution and Management. The Deputy Assistant Administrator (DAA) selects an OSIP manager and Executive Oversight Committee (EOC) members from the participating offices to support efficient execution and management of the process.

The EOC has the following roles and responsibilities: ensure OSIP decisions are aligned with NWS mission priorities, provide oversight to the OSIP Gates (key decision points), participate in OSIP Gate activities when needed, addresses decisions elevated to the EOC, and ratify or set OSIP project priorities.

The OSIP manager has the following roles and responsibilities:

- Work with the headquarters and regional offices to ensure the process is executing properly
- Serve as Secretariat for the Gate meetings and schedule meetings as necessary
- Provide periodic status updates to the DAA and the OSIP EOC
- Monitor the process and recommend improvements
- Ensure OSIP documentation contains the essential information needed for project success

Each FMC has a member for each OSIP Gate. Gate members and Submitting Authorities (SA) are appointed by their FMC Director. All Gate members are given the opportunity to review and comment on projects at any Gate. The Gate members have the following roles and responsibilities:

- Review documents and plans presented for projects and determine their disposition (e.g. Approval to proceed to the next stage or Re-direct to another process)
- Review issues and decide or recommend as appropriate mitigating courses of action.
- Prioritize all projects in OSIP for recourse allocation decision making
- Select staff and other resources as necessary to complete the tasks for the next stage as outlined in the project plan for the projects under consideration

The Gate discussion on issues and decisions may take place at an OSIP Gate meeting, via email, or the OSIP web page, based on project complexity and schedule.

The OCWWS Training Division participates in the review of documents and plans to ensure training needs are addressed and coordinated.

Projects approved at Gate 1 are assigned an Integrated Work Team (IWT) from among the appropriate FMCs and other NOAA Line Offices to perform the activities approved for the following stage. The IWT will have the following roles and responsibilities:

- Perform all planned activities within a stage, in preparation for the next gate
- Ensure coordination across the appropriate functional organizations
- Ensure information and plans are developed and documented

IWT lead and members may change during the various stages based on skill sets required and organizational roles. Any IWT lead changes are approved by the FMCs involved (both the

original IWT lead office and the new office). Specific roles and responsibilities of the IWT and the IWT Leader will be further described in appendices 1 through 5.

Decisions at the gates and at the IWTs are as follows: Approval to proceed to the next Stage is based on full Consensus from all voting members. Any Gate member or office accountable for delivery of the product or service has right to appeal the decision to the OSIP Executive Oversight Committee (EOC) for resolution. The Gate may choose one of the following dispositions for the project being addressed:

- **APPROVED** - No issues found. The documents submitted for review by the Gate are approved. The Gate agrees the resources necessary for the next stage are available or will be available to complete the steps outlined in the Project Plan and they identify and concur with IWT membership. Project proceeds to the next stage.
- **CONDITIONALLY APPROVED** - issues found. Some clarification or minor additional work is needed in one or more of the documents submitted for Gate review and approval. Project will be allowed to proceed to the next stage, but the stated condition(s) are addressed prior to the next gate. The next gate will review the conditions.
- **NOT READY** - significant additional work is needed. Project returns to this gate for disposition.
- **REJECTED** - deemed not within the NWS mission, insufficient cost benefit to merit pursuit, need is already met, or other reason is stated by the Gate. No further action is planned
- **REDIRECTED** - handed off to other processes (e.g. CCB or SREC) if the nature, scope and resource requirements are appropriate for the process. In addition, the solution is understood and agreed to by the stakeholders and the information necessary for the process is provided.

4. Process Description. OSIP consists of end-to-end activities for transforming approved needs or scientific and technical opportunities into deployed solutions. OSIP is used to: collect and validate needs and opportunities; explore and define concepts of operation; research and analyze potential solutions; plan, support and track operational development; deployment, assessment and lifecycle support for the developed solution. The solution for a need or opportunity may be a new or a modification to a system, software application, service, or process. These efforts are performed and evaluated in five stages.

Needs and opportunities being addressed in OSIP are referred to as “projects”. At the completion of each OSIP stage the Gate members review the project details and decide on the disposition of the projects based on maturity of the necessary documents, strategic and operational priorities, resources required (human and financial), impact or changes to working conditions, and any other pertinent information. The five stages of the OSIP and related documentation are described section 4.1 through 4.5.

NOTE: (1) The complexity and length of the documentation is determined by the nature of the individual project. Documentation should be as concise and straight forward as possible.

(2) Since projects may be re-directed to another process (such as a Configuration Control Board) if appropriate, at any Gate, not all projects will go through all stages in OSIP.

4.1 Stage 1 - Collection and Validation of Needs and Opportunities.

Before entering OSIP, the originator of a need or opportunity works with their Submitting Authorities (SA) to determine if their need or opportunity is appropriate for OSIP. An SA is selected by their respective FMC to review the needs and opportunities described in a Statement of Need (SON), clarify or add SON information as necessary, and make a determination on the suitability of a proposed submission for the NWS. When appropriate, the SA submits the SON for OSIP processing which initiates the beginning of Stage 1.

During Stage 1 the user need or opportunity may be further defined and documented and a project plan identifying what will be done from the beginning of a project to the end of a project (to the extent possible based on information known at that time) is developed. At a minimum, the project plans identify what will be done after stage 1. At Gate 1, the proposed need or opportunity is validated and prioritized, the project plan is evaluated and a disposition is made regarding the next steps. The following are the main activities for Stage 1:

- Prepare SON.
- Prepare initial Project Plan.
- Submit SON and Project Plan documents to OSIP.
- Review documents and resolve issues or questions.
- Upload documents to PACE/OSIP web page and schedule gate
- Determine OSIP Gate 1 disposition.

Appendix 1 provides the detailed steps to effect these activities.

4.2 Stage 2 – Research and Concept Exploration and Definition

After the activities are completed and approved in Gate 1, the project will advance to Stage 2 (if not redirected), where additional documents are prepared and the Project Plan is updated. The focus of activities during this stage is to identify and define the concept of operations and operational requirements for potential solutions. If the concept of operations is not readily identifiable, then exploratory research can be conducted (and reviewed following NWS Directive 80-5 Science Review and Approval, as appropriate) to assist with the development of the concept of operations and operational requirements. The following are the main activities for Stage 2:

- Conduct and Review Exploratory Research, if necessary.
- Prepare Concept of Operations and Operational Requirements Document.
- Update Project Plan.
- Review documents and resolve issues or questions.

- Upload documents to PACE/OSIP web page & schedule gate
- Determine OSIP Gate 2 disposition.

Appendix 2 provides the detailed steps to effect these activities.

4.3 Stage 3 - Applied Research and Solution Analysis

After the activities are completed and approved in Gate 2, the project will advance to Stage 3, where additional documents are prepared and the Project Plan is updated. The focus of activities during this stage is the conduct (and reviewed following NWS Directive 80-5 Science Review and Approval, as appropriate) of research and analysis on potential solutions and the planning and documentation to support development of the selected solution. The following are the main activities for Stage 3:

- Conduct and review Applied Research, Development, and Demonstration, if prototyping is necessary.
- Identify solution alternatives.
- Perform a requirements analysis to decompose and validate Stage 2 operational requirements into a detailed set of Technical Requirements.
- Update Project Plan.
- Prepare Training Plan if necessary.
- Conduct Business Case Analysis.
- Prepare Operational Development Plan.
- Review documents and resolve issues or questions.
- Upload documents to PACE/OSIP web page & schedule gate
- Determine OSIP Gate 3 disposition.

Appendix 3 provides the detailed steps to effect these activities.

4.4 Stage 4 - Operational Development

After the activities are completed and approved in Gate 3, the project will advance to the Stage 4, where additional documents are prepared and the Project Plan is updated. The focus of activities during this stage is the design and development of the approved solution. The following are the main activities for Stage 4:

- Perform the detailed design (how) of the product or service which will meet all Technical Requirements (what).
- Develop the operational product(s) or service which meets all requirements
- Test the developed product or service against the requirements to ensure they actually meet all requirements.
- Prepare Deployment Decision Documentation.

- Prepare Program Management Responsibility Transfer Plan, if required.
- Prepare Deployment, Assessment, and Lifecycle Support Plan.
- Update Project Plan with deployment activities.
- Review documents and resolve issues or questions.
- Upload documents to PACE/OSIP web page & schedule gate
- Determine OSIP Gate 4 disposition

Appendix 4 provides the detailed steps to effect these activities.

4.5 Stage 5 - Deployment, Assessment, and Lifecycle Support

After the activities are completed and approved in Gate 4, the project will advance to Stage 5, where the activities listed for Stage 5 in the Project Plan are carried out. The focus of activities during this stage is the deployment of the developed solution. The following are the main activities:

- Implement Deployment, Assessment, and Lifecycle Support Plan.
- Implement the Program Management Responsibility Transfer Plan, as required.

Appendix 5 provides the detailed steps to effect these activities.

5. Project Status. Needs and opportunities validated at Gate 1 become OSIP projects and proceed through the OSIP stages in the manner described above. As the projects progress through OSIP they are classified with a status identifier. The following is the list of possible status identifiers:

On Track	The project is currently being worked and expected to meet the next planned Gate date.
Concern	The project will likely not meet the next planned Gate date.
Problem	The project will not meet the next planned Gate date. Re-planning is required.
Idle	The project is awaiting some event or resources outside the control of OSIP.
Complete	The project has successfully completed its last planned milestone and is implemented.
Closed	No additional OSIP efforts apply to the project. The project was Redirected to another process, the project was withdrawn, or the Gate has made a decision to terminate the project.

APPENDIX 1

Operations and Services Improvement Process

Stage 1 – Implementation Steps for Collection and Validation of Needs and Opportunities

This Appendix provides specific information on the steps necessary to carry out Stage 1 of the Operations and Services Improvement Process. There are five basic steps. The activities during each step are described herein.

1. Prepare the SON

Persons who have a need, idea or opportunity which may improve NWS operations or services are encouraged to hold discussions with the OSIP Submitting Authority (SA) for their FMC -- Office, Region or National Center. The discussions should facilitate the gathering of information and data necessary to complete the SON form and consider what should be done in the next stage of the project.

Note: External users should relate needs or opportunities to their NWS point of contact. The NWS point of contact would in turn hold the necessary discussion with their SA.

Definition: Submitting Authorities are individuals named by their respective FMC to review a SON, clarify or add SON information as necessary, and make a determination on the suitability of a proposed submission for the NWS.

Information: OSIP uses a *Project Plan* to identify what needs to be accomplished, who will do it, and provide cost estimates. The Project Plan also addresses risks and assumptions and is updated during each OSIP stage. At any stage, the minimum information required in the Project Plan are the resources and details about what will be done during the next stage. Project information may be forwarded to the NOAA Program Managers for consideration as alternatives in the PPBES; for budgetary consideration or to address gaps. Such projects are expected to have sufficient details in the Project Plan to facilitate and support PPBES decisions.

The need is entered using the SON form on the OSIP web site at: <https://osip.nws.noaa.gov>. Specific instructions for filling out the SON form are available on the web site. This site requires LDAP authentication and a NWS user email account for access. NWS points of contacts or Submitting Authorities will complete the form online for external users.

The person entering the need (referred to as “originator”) logs into the OSIP web site, selects the “SON Form” link, and fills out as much detail as is available. The minimum required information includes sections 1.1 through section 1.3 inclusive. All information will eventually be necessary and providing more information up front helps with the completion of Stage 1.

2. Submit SON.

From the OSIP Web site, the originator or SA may attach other supporting documentation by using the appropriate fields and browse button on the SON Form. The information entered in the SON web form may be viewed and printed by selecting the *View PDF* button.

The SON is submitted by selecting the *Submit* button. Once Submitted, an automatic email is sent to the SA informing them a SON is in the queue awaiting review.

When the SA logs into the OSIP web site, SONs awaiting review are displayed. The SA may select a SON for review, edit, authenticate or reject the SON. The SA should contact the originator if there are questions to be addressed or additional data are required.

The SA will *Reject* a SON if the stated need or opportunity is not under NWS purview, or the need or opportunity is already being worked on or already available. *Note:* If rejected, the Form will require entry of the reason for rejection. Selecting the Reject button will result in an email notification of the Rejection to the originator (along with the stated reason).

The SA will *Authenticate* the SON if the SON is consistent with the NWS mission and is deemed to improve, facilitate or sustain NWS operations or services. Selecting the “Authenticate” button results in the delivery of an email notification to the originator and initiates OSIP processing.

REMINDER: The SON is not submitted for further processing and not accessible to the SA until the Submit button is selected.

3. Prepare Project Plan.

Originators and SAs are encouraged to plan for what will be done next when submitting a SON – e.g. perform exploratory research or develop the concept of operations, and to provide that information in the Project Plan which is available for download on the OSIP web site. If the recommendation is to redirect to another NWS process, justification is needed in the Project Plan. Otherwise, the Project Plan is required at each OSIP Gate, and is designed to include activities, resources cost and scheduling information for all OSIP stages. The project plan should include as much information as is known at the time for the next stage, and subsequent stage activities and resources. The project plan is web based and can be initiated and edited once the SON has been received for OSIP processing (submitted, authenticated and entered in the OSIP database).

4. Review Documents and Resolve Issues or Questions.

Once received for OSIP processing, *OSIP Analysts* at NWS Headquarters (NWSHQ) will review the SON for completeness. OSIP Analysts are NWSHQ personnel who enter information in the OSIP requirements management tool, assist IWT members with OSIP matters, and schedule Gate

review meetings. If any essential information is not provided or not clear then the OSIP analyst will contact the SA or originator for assistance in completing the SON or the initial Project Plan. Once the documents are ready for review, a *Review Team* meeting and a Gate 1 meeting are scheduled. The review team is composed of OSIP Analysts and representatives from all the FMCs (Gate members or their support staff). The following questions are addressed during the Review Team meeting:

- Is the need or requirement valid and under the purview of the NWS?
- Are there any issues to be resolved?
- Is there additional coordination or vetting of information required?
- What should be the recommended Mission Priority and Field priority?
- Who should be involved in the next steps? (identify candidate members to an Integrated Work Team, who carry out the follow on activities)
- Does the need clearly fall within the purview of established Change Management, or SREC, or other process and is therefore a candidate for redirection?

The answers to the above assist the support staff in making a recommendation to the gate for disposition of the SON during the Gate 1 meeting.

5. Determine OSIP Gate 1 Disposition

A formal Gate 1 meeting is held with representatives from all the FMCs to address SONs which have been submitted. SONs which are under the purview of an existing program or process, do not require additional funding, and have a solution with the concept sufficiently identified for the developers may be redirected to that program or process.

During the Gate 1 meeting, the recommendations from the Review Team are presented, and Gate members have an opportunity to address issues, ask questions, assign priority, identify resources and determine the disposition of the SONs.

Overall Corporate priority for OSIP projects takes into account both the Strategic priority (Importance to meeting governmental, DOC, and NOAA mandates; avoiding degradation of services, and positioning NWS for future success and service improvements) and Operational priority (Importance to maintaining and improving overall NWS Field Operations and Services). The priority is used as a tool by the Gate in their decisions on resource use, IWT alignment, and recommendations to the developers. Priority does not determine applicability for redirection. Projects with highest overall priorities should have more resources made available to them.

Considerations for disposition by the Gate include: Approved, Conditional Approved, Not Ready, Rejected, or Redirected as defined in section 3 of the instruction. Approved implies that documentation for this stage, the SON and initial Project Plan are approved.

After the Gate 1 meeting the meeting notes, disposition, and actions are entered in the requirements management tool by an OSIP Analyst. The Gate members propose members from their FMCs, as needed, to be part of the IWT which is responsible for carrying out the activities

for the next stage.

Any Gate member or the OSIP Manager may elect to elevate unresolved issues to the EOC.

Terms, Roles and Definitions

SON: Statement of Need

Originator: The person who fills out the web based SON and forwards it to Submitting Authority (SA). The SA may also be an Originator.

Submitting Authority: NWS representatives for the Offices / Regions, and National Centers who review, edit and reject or authenticate the SON.

OSIP Analysts: NWS Headquarters personnel who enter information in the OSIP requirements management tool, assist IWT members with OSIP matters, and schedule Gate review meetings.

Support Staff (Gate Review Team members): NWS personnel, who support Gate Members and review OSIP documentation for review meetings, solicit candidate IWT composition, participate in Gate 1 Review Team meetings, recommend disposition and priority, brief Gate member on review meeting recommendations, and plan for future Gate and Review meetings.

Gate 1 Members: NWS employees who represent their respective office, region, or national center, participate in Gate meetings, provide approval decision on documents and plans, assign resources for next stage (if approved), and may also redirect project to a Configuration Control Board, or other process, or elevate to the OSIP Executive Oversight Committee (EOC.)

IWT: Integrated Work Team. Technical experts who develop or participate in OSIP stages and perform activities as assigned, such as research, documentation, etc. The IWT Lead is responsible for the coordination of the activities and documentation, and enters documentation in the OSIP requirements management tool.

APPENDIX 2

Operations and Services Improvement Process Stage 2 – Implementation Steps for Research and Concept Exploration

This Appendix provides specific information on the steps necessary to carry out Stage 2 of the Operations and Services Improvement Process.

During Stage 1 a SON and an initial Project Plan were developed. The Project Plan identified what is to be accomplished during the life of the project, with a minimum of what would be done in this stage, Stage 2. The Project Plan also identified (to the extent known) the offices or organizations involved in the activities, resources required, funding profiles, risks and assumptions related to the project.

The Gate 1 members identified resources for Stage 2, including representation for the Integrated Work Team (IWT) for the project. The IWT is responsible for carrying out the activities and developing the documentation necessary for Stage 2. The IWT is made up of users, developers and experts in the field(s) associated with the need as well as operational support, and training personnel as necessary. IWT members represent their office or organization with respect to the project and are expected to coordinate issues, questions, or requirements for their respective organization.

The IWT *Lead* is responsible for the coordination of team activities and for providing the documentation and briefs as necessary to support the project. The IWT Lead uploads the documents to the OSIP requirements management tool (also known as PACE) and reports progress or issues to the OSIP Analyst. RMT training is provided by OCWWS.

After successfully completing Stage 1 and gaining approval for Stage 2, the assigned IWT will perform the activities summarized in the approved Project Plan for Stage 2.

NOTE: The size and complexity of the documents generated in this and subsequent stages are to be determined by the nature of the project. Not all of the activities listed in this stage / section apply to all projects; each project's Plan will define those activities required for that project.

For projects which a scientific or technical opportunity is identified and exploratory research is necessary for a proof of concept or idea, or to evaluate effectiveness, the first step in Stage 2 is exploratory research. Other projects proceed directly to the development of the Concept of Operations and Operational Requirements Document. The decision on how to proceed is made during the Gate 1 meeting. The basic steps for Stage 2 are described below:

1. Conduct Exploratory Research

Most often projects entering Stage 2 address a need or scientific or technological opportunity that has been sufficiently researched to proceed with preparation of the concept of operations, step 2 below. However, in some cases, particularly for scientific and technological

opportunities, the operational utility may not be clearly understood. Before beginning the task of developing the concept of operations, exploratory research is needed to fully appreciate the potential operational benefits and impacts. This effort may also assist in mitigating the risk of proceeding with projects that may have marginal operational benefit or which are not sufficiently mature to justify an investment of resources. The need to conduct this exploratory research is described in the project plan approved at Gate 1. The project plan will also provide a description of the exploratory research to be conducted by the assigned IWT. This step may include initial prototype or proof of concept development.

The IWT will document the results of the exploratory research and analysis in the Concept/Research Exploration Results document. The template for this document is on the OSIP Templates Web Page, <https://osip.nws.noaa.gov/osip/documenttemplates.php>. The completed document should represent the consensus views of the IWT. The IWT may, and often should, solicit independent review of these results prior to proceeding with subsequent steps of Stage 2 described below. The results document is to be made available for information to the OSIP Review Team and Gate members, but will not be officially approved by the Gate.

Note: Projects proceeding into Stage 2 and beyond are urged to use the OSIP templates. However, if pre-existing documentation addresses the content of the templates, they may be used in place of the OSIP templates. For example, a published paper in a scientific journal can act as a replacement for the exploratory or applied research templates.]

2. Prepare Concept of Operations and Operational Requirements Document

The most important step in the systems development process is the complete and accurate communication of scope, concept and operational requirements from those who will use the system to those who will build it. The Concept of Operations and Operational Requirements (ConOps/ORD) document conveys a conceptual overview of the proposed system from the user's viewpoint including operational requirements for the proposed or needed system.

The ConOps provides an operational view of the existing and proposed systems and their functional characteristics, and includes a summary of the anticipated impacts associated with the new system. An operational requirements table is included in the ConOps to clearly communicate from an operational perspective what the proposed data or system will do. Operational requirements defined at the beginning of a program are the primary determinants of what a system will actually do.

During the preparation of the ConOps/ORD, the IWT analyzes the proposed system concept. This activity identifies and communicates the needs, classes of users, modes of operations and what the desired system will do operationally. The results are documented in the ConOps/ORD. The following is an outline for the document:

- Introduction
- Current State of Operations
- Proposed Concept of Operations

- Operational Scenarios
- Summary of Impacts
- Alternatives Analysis
- Requirements Development
- Operational Requirements

The scope and complexity of the document is commensurate with the scope and complexity of the proposed need or system. The intent is to provide all of the information necessary to explicitly describe the proposed system and to convey the high level requirements such that developers and engineers may then decompose those requirements into detailed technical requirements associated with a solution which meets the user's need.

A template in Microsoft Word for the Concept or Operations and Operational Requirements Document and specific instructions for filling out the document are available on the OSIP web site at: <https://osip.nws.noaa.gov/osip/documenttemplates.php>. This site requires LDAP authentication and a NWS user email account for access.

3. Update Project Plan

The IWT updates the Project Plan to specify at a minimum what needs to be done during OSIP Stage 3, and who will do it. All elements of the Project Plan and all future activities including those beyond Stage 3 are updated with any new or revised information available. The IWT lead accesses the RMT, selects the appropriate project, and selects to edit the Project Plan for that project. The lead updates the plan, saves the revised document into the RMT, and notifies the OSIP Analyst so a review for the documentation can be scheduled prior to the Gate 2 meeting.

4. Review Documents and Resolve Issues or Questions

Once the documents have been updated in the RMT, *OSIP Analysts* at NWS headquarters update the project status information and schedules a Review Team meeting and a Gate 2 meeting. Review Team members review the Stage 2 documents and address the following during the Review Team meeting:

- Were the actions specified in the Project Plan at the end of stage 1 completed in stage 2?
- Are there any issues to be resolved?
- Is there additional coordination or vetting of information required?
- Who should be involved in the next steps? (candidate members for the IWT for Stage 3)
- Are the documents complete and do they correctly convey the information necessary?
- Are funding and resource estimates detailed enough to support follow-on stage(s)?
- Is training required to support the use of new systems, processes or procedures?

The answers to the above questions assist the support staff in making a recommendation to the gate for disposition during the Gate 2 meeting.

5. Determine OSIP Gate 2 Disposition

A Gate 2 meeting is held with representatives from all the OSIP functional areas to address the products to be approved at the Gate. During the meeting, the recommendations from the Review Team are presented, and Gate members have an opportunity to address issues, ask questions and determine the disposition of the products presented for approval. The meeting is typically a formal meeting with attendees present in person or via phone conference, however in limited situations, the meeting may be ‘virtual’. If a project is well defined and coordinated, has no issues identified during the Review Team Meeting, is not sensitive (requiring specific or direct communications with Gate members), and all Review Team members recommend “Approval”, then that project is scheduled for a virtual meeting. Virtual meetings are accomplished by having the Gate Voting members enter their decision via the OSIP web site on or before the scheduled “Virtual” meeting deadline. After the meeting date an email is sent out tallying all the votes to the Gate members.

During the Gate meetings, considerations for disposition by the Gate include: Approved, Conditional Approved, Not Ready, Rejected, or Redirected as defined in section 3 of the instruction. Approved implies that documentation for this stage, the Concept/Research Exploration results (if identified as a deliverable in the Project Plan), the Concept of Operations and Operational Requirements Document, and the updated Project Plan are approved.

After the Gate 2 meeting (Formal or Virtual) the meeting notes, disposition, and actions are entered in the requirements management tool by an OSIP Analyst.

The Gate members inform their IWT members (via their managers if appropriate) of their responsibilities for the project in the follow on stage(s).

Any Gate member or the OSIP Manager may elect to elevate unresolved issues to the EOC.

APPENDIX 3

Operations and Services Improvement Process Stage 3 – Implementation Steps for Applied Research and Solution Analysis

This Appendix provides specific information on the steps necessary to carry out Stage 3 of the Operations and Services Improvement Process. There are eight basic steps to Stage 3. The activities during each step are described herein. In Stage 3 the IWT will be expanded to achieve the engineering and analysis needed to fully define and assess alternative solutions.

After successfully completing Stage 2 and gaining approval for Stage 3, the assigned IWT will perform the activities summarized in the approved Project Plan for Stage 3. NOTE: The size and complexity of the documents generated in this and subsequent stages are to be determined by the nature of the project. Not all of the activities listed in this stage / section apply to all projects; each project's Plan will define those activities required for that project.

1. Conduct Applied Research, Development, and Analysis

The assigned IWT will conduct the applied research, development, and solution analysis as described in the approved Project Plan. The purpose of this activity is to:

- Fully explore the merits of the previously identified alternative solutions,
- Consider any other alternative solutions that the research and analysis may reveal, and
- Conduct any prototype or proof of concept development that may be required to adequately assess each alternative.

As a condition for completing these activities, the IWT is confident the most appropriate solutions have been identified and any significant development risks have been mitigated.

For projects requiring Applied Research and Development (as identified in the Project Plan), the IWT will document the results of the research, development, and analysis in the Applied Research and Development Results document. The template for this document may be downloaded from the OSIP Web Page, <https://osip.nws.noaa.gov/>. The IWT will provide this document to the OSIP Gate members for approval. Detailed review, coordination, and approval of this document will be conducted by and among the IWT prior to submitting it to the Gate, to include any reviewers that each participating organization may deem helpful in completing an accurate and complete description of the results of the applied research and development.

2. Identify Possible Solutions

In Stage 2 the ConOps/ORD for the specific SON was defined and approved. In Stage 3 the assigned IWT will conduct an analysis of the ConOps/ORD and further define and analyze potential solutions. The end result of this activity includes clearly described alternative solutions and an assessment of how well each solution complies with the ConOps/ORD.

The IWT will identify each system affected or potentially affected with the implementation of

each alternative solution, identifying affected interfaces and functionality in those systems. The IWT will prepare briefing slides to present this assessment to the appropriate OSIP Review Team and OSIP Gate, and potentially to other committees that may have interest or purview of proposed solutions.

3. Define and Document the Technical Requirements

The generation of technical requirements is an engineering activity, and should be performed by IWT members with experience in the generation of such requirements. There are many industry and government standards bodies that have developed standards and guides for the generation of technical requirements. The IWT should include members cognizant of those standards and with the experience to properly apply them.

Technical requirements further define and constrain the potential solutions and provide a more detailed view that the final solution meets the functional, performance, and interface requirements. The Project Plan approved at Gate 2 documents the need to develop the technical requirements. In general the technical requirements will conform to the standards or formats of requirements for the parent system, unless an alternate is recommended by the IWT and approved by Gate 2. In the absence of a parent system or program preferred template, the default Technical Requirements template provided on the OSIP Web Page should be used. This template is based upon guidance from Institute of Electrical and Electronics Engineers (IEEE) Standard 1233, "IEEE Guide for Developing System Requirements Specifications".

In Stage 3 the IWT will document the highest level of technical requirements in a Technical Requirements document. This level of requirements will be written at the system or subsystem level, even though the solution may be a modification to an element of an existing system or subsystem. The IWT will ensure that each requirement specified in the ConOps/ORD is addressed in the Technical Requirements document.

For more complex solutions, several layers of technical requirements may be needed, each layer progressively elaborating the requirements of the solution. In this case the requirements at greater detail than the system level described in the Technical Requirements document will be generated as a part of Stage 4. An example would be where the solution is a new system, composed of several subsystems, each composed of many components in which software, hardware, and interface requirements may be specified in separate documents.

The IWT will provide the Technical Requirements document to the OSIP Gate members for approval. Detailed review, coordination, and approval of the technical requirements will be conducted by and among the IWT prior to submitting it to the Gate, to include any reviewers that each participating organization may deem helpful in completing an accurate, complete, and achievable set of requirements.

4. Prepare Business Case Analysis

The IWT will prepare a Business Case Analysis (BCA) to present a detailed comparison of the

potential alternative solutions, with the recommendation of the IWT as to which alternative is preferred. The BCA is a critical element in demonstrating to NWS, National Oceanic and Atmospheric Administration (NOAA), and Department of Commerce management that a program is a prudent investment and will support and enhance the ability of the NWS to meet current and planned demand for its products and services. The BCA also assists NWS program managers and management in meeting programmatic and budgetary review requirements. The BCA will articulate the business case for the alternative solutions, identify costs, scope, schedule, and risks early in the lifecycle before funds are spent, and facilitate securing funding and approval to proceed with development in Stage 4.

The results of the BCA will be documented in accordance with the OSIP template, which may be found on the OSIP Web Page. The IWT will present the BCA to the Gate for approval, as it is one of the primary decision documents the Gate members will use to determine the disposition of the subject project and the solution alternative to pursue in Stage 4.

5. Update Project Plan

The IWT will update the Project Plan with each stage, presenting the plan for the next stage, Stage 4 in this context, and as much as is known for the final stage, Stage 5. The IWT will continue to use the same template for the Project Plan as for previous stages, with the clarification that for Stage 4, the preferred solution alternative is selected and full operational development of the solution will commence. The Stage 3 Checklist in the Project Plan should be completed, with the IWT ensuring that “Required” items noted for Stage 3 at Gate 2 are complete, with all pre-Gate reviews and approvals completed. The “Required” column in the Stage 4 Checklist should be filled in with an “X” for those deliverables expected at Gate 4. Identification of the Lead Office and Point of Contact should be provided in the appropriate table cells.

The IWT pays particular attention to the Acquisition Strategy and the Risk Assessment and Mitigation sections in this version of the Project Plan, and summarizes the schedule and costs for the development, test, and deployment phases. The Project Plan will also include a summary of the Operational Development Plan (ODP). For detailed information, the BCA described above presents detailed cost and schedule information and the ODP, described below, presents the detailed development plan that the development manager will execute.

Where technology or services are obtained through contract, NWS Policy Directive 1-11 for Acquisition Management and the procedures described in NWS Instruction 1-1101, Acquisition Management Instruction, will be followed and reflected in the Project Plan.

6. Prepare Operational Development Plan

The IWT member selected to be the development manager for Stage 4 will lead preparation of the ODP. The ODP defines the stages of planning, executing, and controlling the operational development phase of the OSIP, which is the final phase prior to deploying the developed capability. Based on previously completed requirements and scope planning, the ODP will

reflect the development approach best suited for the particular addition or improvements to the enterprise. Planning associated with the ODP includes identifying activities, sequencing, and estimating duration, each of which is further described within the template. The ODP should also include training components as necessary for those who will use and maintain the system.

Detailed review, coordination, and approval of the ODP will be conducted by and among the IWT, to include any reviewers that each participating organization may deem helpful in completing an accurate, complete, and achievable plan for completing the Stage 4 activities. The IWT will provide the ODP to the OSIP Gate members for approval. For projects which result in a new system or major modification, NWS Policy Directive 80-3, Systems Engineering, and related procedural directives may apply, as directed by Gate 3.

In the case where Stage 4 is to be executed by a contractor, the IWT Leader will ensure that the contractor prepares a detailed ODP, which minimally contains the information contained in the OSIP template. If the contractor will not be aboard until after Gate 3, then the summary of the operational development contained in the Project Plan will suffice for Gate 3. The IWT Leader, really the Project Manager at this point, will ensure that the contractor plans and executes an operational development which will meet the cost, schedule, and requirements approved at Gate 3.

7. Review Documents and Resolve Issues or Questions

All documents, briefings, or other products selected by the IWT to represent its delivery in Stage 3 will be provided to the Gate Review Team. The documents may be downloaded from the OSIP Web Page. All NWS Financial Management Centers (FMCs) will have an opportunity to review the provided Stage 3 documents, either as a participant in the IWT, the Review Team, or the Gate.

In documenting and presenting the results of this stage, the IWT will be expected to have fully reviewed the products comprising the output of this stage and will approve these products by consensus of the IWT members. The IWT is expected to achieve consensus. If it cannot achieve consensus within the IWT, then the next level of management of participating IWT members will be engaged to resolve any differences. If the next level of management still cannot resolve the differences, then the office directors will be engaged to resolve any issues. If the issue still cannot be resolved, then the IWT will present the issues to the corporate board committee designated by the OSIP Gate for final disposition.

8. Determine OSIP Gate 3 Disposition

A formal Gate 3 meeting is held with representatives from all the OSIP functional areas to address the products to be approved at the Gate. During the meeting, the recommendations from the Review Team are presented and Gate members have an opportunity to address issues, ask questions, and determine the disposition of the products presented for approval.

The meeting is typically a formal meeting with attendees present in person or via phone

conference, however in limited situations, the meeting may be 'virtual'. If a project is well defined and coordinated, has no issues identified during the Review Team Meeting, is not sensitive (requiring specific or direct communications with Gate members), and all Review Team members recommend "Approval", then that project is scheduled for a virtual meeting. Virtual meetings are accomplished by having the Gate Voting members enter their decision via the OSIP web site on or before the scheduled "Virtual" meeting deadline. After the meeting date an email is sent out tallying all the votes to the Gate members.

Considerations for disposition by the Gate include: Approved, Conditional Approved, Not Ready, Rejected, or Redirected as defined in section 3 of the instruction. Approved implies that documentation for this stage, the Business Case Analysis, the updated Project Plan, and the other documents submitted to the Gate are approved.

After the Gate 3 meeting (formal or virtual), the meeting notes, disposition, and actions are entered in the requirements management tool by an OSIP Analyst. The Gate members inform the IWT members (via their managers if appropriate) of their responsibilities for the project in the follow on stage(s).

Any Gate member or the OSIP Manager may elect to elevate unresolved issues to the EOC.

APPENDIX 4

Operations and Services Improvement Process Stage 4 – Implementation Steps for Operational Development

This Appendix provides specific information on the steps necessary to carry out Stage 4 of the Operations and Services Improvement Process. There are eight basic steps to Stage 4. The activities during each step are described herein.

After successfully completing Stage 3 and gaining approval for Stage 4, the assigned IWT will perform the activities summarized in the approved Project Plan for Stage 4. NOTE: The size and complexity of the documents generated in this and subsequent stages are to be determined by the nature of the project. Not all of the activities listed in this stage / section apply to all projects; each project's Plan will define those activities required for that project.

1. Perform Operational Development

After successfully completing Stage 3 and gaining approval for Stage 4, the IWT will perform the operational development activities summarized in the approved Project Plan and described in the ODP. The purpose of this stage is to fully implement the previously selected solution, verifying that the solution meets the operational and technical requirements, to conduct preparations to deploy the solution to operations, and carry out the actions stated in the Training Plan (if applicable for the project) required to implement and maintain the solution. The IWT by this phase is certainly a project team, and the IWT Leader is a Project Manager. Whether the project is small or large, the activities conducted during this stage will result in a change to the NWS enterprise, so they meet high standards for quality. Further, preparations for supporting the implemented solution are completed prior to deploying the solution, so that future operation and maintenance is assured.

The IWT during Stage 4 may be wholly government, government lead with contractor support, or wholly contractor provided, as approved by Gate 3. Where technology or services are obtained through contract, NWS Policy Directive 1-11 for Acquisition Management and the procedures described in NWS Instruction 1-1101, Acquisition Management Instruction, will be followed.

2. Perform Project Management

During Stage 4 the IWT is working to implement and verify a specific solution, to an approved schedule and budget. The IWT Leader (i.e. Project Manager) will ensure that the project proceeds in accordance with the detailed ODP, tracking and periodically reporting progress to the OSIP Gate 4, which will ultimately have the responsibility for considering the project for deployment in the final OSIP stage, Stage 5.

3. Prepare Deployment Decision Document

After completing the operational development activities, including verification that the solution meets requirements, the IWT will document readiness for deployment in the Deployment Decision Document. The Deployment Decision Document summarizes the results of the development and verification activities and presents the results of preparations for deployment, support and training. The IWT will provide this document to the Gate for approval, as it is one of the primary decision documents that the Gate members use to determine the disposition of the subject project at Gate 4.

4. Prepare Deployment, Assessment, and Lifecycle Support Plan

The Deployment, Assessment, and Lifecycle Support Plan is the plan for the final OSIP stage, Stage 5. The IWT will provide this document to OSIP Gate members for approval. Detailed review, coordination, and approval of this plan will be conducted by and among the IWT prior to submitting it to the Gate, to include any reviewers that each participating organization may deem helpful in completing an accurate, complete, and achievable plan for this phase of the project.

5. Prepare Program Management Responsibility Transfer Plan

For those projects for which responsibility will transfer after deployment to an operations and maintenance organization, the IWT will prepare a Program Management Responsibility Transfer (PMRT) Plan. A smooth and orderly transfer of program management responsibilities is an important component in the life cycle of an operational system or capability. The PMRT is part of a natural progression from the acquisition phase to the operational support phase. As this document describes long-term financial and functional responsibility for operating and maintaining the deployed solution, this document is to be prepared for review and approval by the OSIP Gate.

6. Update Project Plan

The Project Plan is updated for the final time, presenting the plan for the final stage, Stage 5. The Project Plan continues to use the same template, with the clarification that for Stage 5, the preferred solution is to be fully deployed and operational. The Stage 4 Checklist in the Project Plan should be completed, with the IWT ensuring that "Required" items noted for Stage 4 at Gate 3 are complete, with all pre-Gate reviews and approvals completed. The final assessment report, if required, will be listed as a next stage deliverable in the project plan, with the expected delivery date.

The IWT pays particular attention to the activities required to close out any contracts, initiate new contracts, and summarize future years funding requirements. The Risk Assessment and Mitigation section should be updated to reflect any persisting or new elements of risk that may affect the deployment activities. The Project Plan will also include a summary of the Deployment, Assessment, and Lifecycle Support activities, which are described in detail in a separate plan (described above).

7. Review Documents and Resolve Issues or Questions

All documents, briefings, or other products selected by the IWT to represent its delivery in Stage 4 will be provided to the Gate Review Team and Gate members in accordance with the Gate 4 Rules of Order, which may be downloaded from the OSIP Web Page. All NWS FMCs will have an opportunity to review the provided Stage 4 documents, either as a participant in the IWT, the Review Team, or the Gate.

In documenting and presenting the results of this stage, the IWT will be expected to have fully reviewed the products comprising the output of this stage and will approve these products by consensus of the IWT members. The IWT is expected to achieve consensus. If it cannot achieve consensus within the IWT, then the next level of management of participating IWT members will be engaged to resolve any differences. If the next level of management still cannot resolve the differences, then the office directors will be engaged to resolve any issues. If the issue still cannot be resolved, then the IWT will present the issues to the corporate board committee designated by the OSIP Gate for final disposition.

8. Determine OSIP Gate 4 Disposition

A formal Gate 4 meeting is held with representatives from all the OSIP functional areas to address the products to be approved at the Gate. During the meeting, the recommendations from the Review Team are presented, and Gate members have an opportunity to address issues, ask questions and determine the disposition of the products presented for approval.

The meeting is typically a formal meeting with attendees present in person or via phone conference, however in limited situations, the meeting may be 'virtual'. If a project is well defined and coordinated, has no issues identified during the Review Team Meeting, is not sensitive (requiring specific or direct communications with Gate members), and all Review Team members recommend "Approval", then that project is scheduled for a virtual meeting. Virtual meetings are accomplished by having the Gate Voting members enter their decision via the OSIP web site on or before the scheduled "Virtual" meeting deadline. After the meeting date an email is sent out tallying all the votes to the Gate members.

Considerations for disposition by the Gate include: Approved, Conditional Approved, Not Ready, Rejected, or Redirected as defined in section 3 of the instruction. Approved implies that documentation for this stage, the Deployment Decision Document, Deployment, Assessment, and Lifecycle Support Plan, updated Project Plan, and Program Management Responsibility Transfer Plan (if required) are approved. Further, the Gate has no issues with the other plans or documents that were prepared for Stage 5.

After the Gate 4 meeting (formal or virtual), the meeting notes, disposition, and actions are entered in the requirements management tool by an OSIP Analyst. The Gate members inform the IWT members (via their managers if appropriate) of their responsibilities for the project in the follow on stage(s).

Any Gate member or the OSIP Manager may elect to elevate unresolved issues to the EOC.

APPENDIX 5

Operations and Services Improvement Process Stage 5 – Implementation Steps for Deployment, Assessment, and Lifecycle Support

This Appendix provides specific information on the steps necessary to carry out Stage 5 of the Operations and Services Improvement Process. There are two basic steps to Stage 5. The activities during each step are described herein.

NOTE: The size and complexity of the documents generated, and the efforts in support of a project are to be determined by the nature of the project. Not all of the activities listed in this section apply to all projects; each project's Plan will define those activities required for that project.

1. Implement Deployment, Assessment, and Lifecycle Support Plan

After successfully completing Stage 4 and gaining approval for Stage 5, the assigned IWT will perform the deployment activities summarized in the approved Project Plan and described in the Deployment, Assessment, and Lifecycle Support Plan. The primary purpose of this stage is to fully deploy the developed and verified solution. The IWT personnel responsible for performing the deployment will ensure proper function of the deployed capability before leaving the installation site. The Deployment, Assessment, and Lifecycle Support Plan will define the specific approach to complete and gain approval of site acceptance. Separate installation and checkout procedures, or other program specific procedures may be performed as required and as described in the Deployment, Assessment, and Lifecycle Support Plan. The deployment phase concludes when all elements of the plan associated with deployment are complete.

The assessment and lifecycle support elements of the plan are long-term recurring activities to be performed by the operations and maintenance (O&M) personnel. The O&M personnel will bring any issues associated with the proper functionality of the deployed capability to the attention of the IWT Leader (i.e. the Project Manager) during the deployment phase. After the deployment phase is completed, any issues associated with the deployed capability will be addressed in the normal change management processes.

The assessment of the deployed capability is an essential element of Stage 5. The O&M personnel should provide an initial assessment to the Project Manager within one month of the installation. Further, the Project Manager will prepare a final assessment report prior to disbanding the IWT, delivering this report to the Gate 4 members. Continuing assessment of the deployed capability is a responsibility of the O&M personnel and a potential input back into the OSIP as a SON at Stage 1.

2. Implement the Program Management Responsibility Transfer Plan

The PMRT Plan is created during Stage 4 for those projects which require it. In general, projects which result in a significant modification to the NWS enterprise, or when responsibility for the long-term O&M may not be clear, a PMRT will be required and will be implemented during Stage 5. Either during or at the conclusion of the deployment phase, the IWT Leader will implement the Program Management Responsibility Transfer Plan. At the conclusion of the transition, the IWT Leader will provide a report to Gate 4 members summarizing the completion of the transition.

Many projects which culminate in the delivery of a new or enhanced capability to the NWS enterprise will not require a PMRT. In these cases the responsibility transfer will be assumed by the O&M organization as a normal course of continuing to manage the operational system into which the new capability has been integrated. Any increased resources to support O&M for this capability will be described in the Project Plan and will be submitted into the NWS budget process by the support organization.