

VIRGINIA CLASS SUBMARINE PROGRAM RISK PROCESS DESCRIPTION

Original: 31 May 1996

Revised: 01 May 1997

Revised: 30 November 1999

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VIRGINIA CLASS SUBMARINE PROGRAM RISK PROCESS DESCRIPTION (RPD)

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VIRGINIA CLASS SUBMARINE PROGRAM RISK PROCESS DESCRIPTION (RPD)

Record of Changes

Change No	Date of Change	Summary of Change
1	01 May 1997	Changes the Risk Process Description to incorporate the On-Line Risk Database Workflow.
2	30 November 1999	Incorporates Risk Management Team decisions regarding the Program's risk process since Change 1.

Introduction

1. Purpose.

This document, the Risk Process Description (RPD), is a guide that describes the VIRGINIA Class Submarine Risk Management Process (formerly called the NSSN Risk Management Process). This process is intended to identify, assess, and eliminate or reduce risk in areas that represent a threat to the successful design, construction, operation, support, and eventual disposal of the VIRGINIA Class Submarine and its systems/components. This process is summarized on the companion VIRGINIA Class Submarine Risk Process Card (RPC).

2. Background.

DoD requires that each program have a plan for the identification and management of risk. The VIRGINIA Class Submarine Program has completed two extensive efforts that assessed program risk for VIRGINIA Acquisition Milestone I and II decisions. Since Milestone II, VIRGINIA risk management efforts have been focused on developing a continuous risk management process that minimizes expenditure of resources and is integral to the Integrated Product and Process Development (IPPD) approach. To oversee implementation, a Risk Process Integration Team (Risk PIT) has been formed. The Risk PIT will maintain the status of known risks, facilitate the proactive identification and analysis of new risk areas, and assist in the development of risk mitigation plans.

3. Who Manages Risk?

Each person involved with the design, construction, operation, support, and eventual disposal of the VIRGINIA or any of its systems or components is a part of the risk management process. This involvement should be considered a part of the normal management process. It needs to be continuous; it only ends when involvement ends. The process includes (1) identifying risk, (2) prioritizing (assessing) risk, (3) developing mitigation plans, and (4) rigorously tracking the risk until it will cause no further adverse consequences.

It is important to involve activities that perform the technical tasks in risk management since technical risk often leads to cost and schedule consequences. The VIRGINIA Class Submarine Program tries to identify all risks since those identified will be managed to avoid serious adverse consequences. Risk that is not identified often does not get managed and can lead to undesirable consequences. This VIRGINIA Class Submarine Program approach to risk management helps correct the paradigm that “the only good risk is low risk.”

4. **Definitions:**

a. **Risk** is defined as an unknown, or an undesirable situation, which has both a likelihood of occurring and a potential adverse consequence.

b. **Risk Management** is defined as an organized, systematic decision-making process that identifies risks, prioritizes risks, and effectively reduces/eliminates risks to achieve program goals.

5. **RPD Format.**

This Risk Process Description describes the process outlined on the Risk Process Card. The sections of the RPC being discussed are included with the text to help the reader keep track of which part of the RPC is being addressed.

VIRGINIA Class Submarine Risk Management Process

(See VIRGINIA Class Submarine Risk Process Description for Detailed Guidance)

Side 1

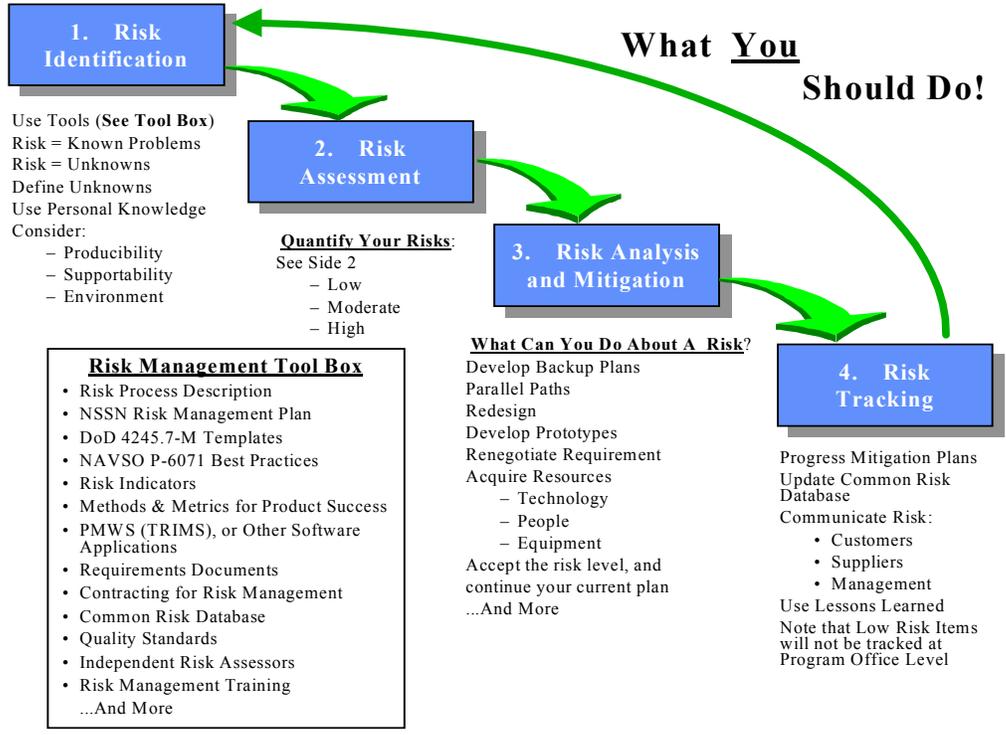
Definitions:

Risk - An unknown, or an undesirable situation, which has both a likelihood of occurring and a potential adverse consequence.

Risk Management - An organized, systematic decision-making process that effectively identifies risks, prioritizes risks, and effectively reduces/eliminates risks to achieve program goals.

How Do You Identify a Risk?

- Best Judgement
- Lessons Learned
- Negative Trends or Forecasts
- New Processes
- Any Processes Lacking Rigor
- Lack of Resources
 - People
 - Funds
 - Schedule
 - Tools
- Unqualified People
 - Knowledge
 - Experience
- Test Failure
- Changing Requirements
- Defining an Unknown
- Qualified Supplier Availability
- ...More



VIRGINIA Class Submarine Risk Process Card
September 1999

Figure 1: Side 1 of the Risk Process Card

Step 1 - RISK IDENTIFICATION

VIRGINIA Class Submarine Program Risk Management is a 4-Step process. See Figure 1. The first step, Risk Identification, is discussed below. Steps 2, 3, and 4 follow.

1. How Do You Identify Risk?

People involved in the technical, cost, and scheduling aspects of designing, testing, manufacturing, supporting, and finally disposing of the VIRGINIA Class Submarine are aware of problems that need to be managed as risk areas. VIRGINIA Class Submarine Program multi-disciplined teams, formed as part of the VIRGINIA Class Submarine Program IPPD process, identify significant concerns early, especially in the areas of producibility, supportability, and the environment. The real challenge of a risk management process is using tools to help identify those unknowns that must be dealt with to avoid adverse consequences. Defining unknowns is a true measure of the success of a risk

management process. The following are recommended sources for identifying risk:

How Do You Identify a Risk?
Best Judgement
Lessons Learned
Negative <u>Trends or Forecasts</u>
New Processes
Any Processes Lacking Rigor
Lack of Resources
- People
- Funds
- Schedule
- Tools
Unqualified People
- Knowledge
- Experience
Test Failure
Changing Requirements
Defining an Unknown
Qualified Supplier Availability
...More

a. **Best Judgement** is the knowledge and experience of the collective multi-disciplined Integrated Product Team (IPT) members and is the most common source of risk identification. IPTs are often called Design/Build Teams (D/BTs).

b. **Lessons Learned** from similar processes can serve as a baseline for the successful way to achieve requirements. If there is a departure from the successful way, there may be risk.

c. **Negative Trends or Forecasts** are cause for concern (risk) and may require specific actions to turn around.

d. **New Processes** should always be suspect, whether they are related to design, analysis, or production. Until they are validated and until the people who implement them have been trained and have experience in successfully using the process, there is risk.

e. **Any Process Lacking Rigor** should also be suspect; it is inherently risky. To have rigor, a process should be documented, it should have been validated, and it should be strictly followed.

f. **Lack of Resources: People, Funds, Schedule, and Tools** are necessary Ingredients for successfully implementing a process. If any are inadequate, there is risk.

g. **Unqualified People: Knowledge and Experience** (and possibly other attributes) may not fit the processes being implemented. When there isn't a fit, there is risk.

h. **Test Failure** may indicate corrective action is necessary. Some corrective actions may not fit available resources, or the schedule, and (for other reasons as well) may contain risk.

i. **Changing Requirements** contain inherent risk in completing the job on schedule and with the budgeted funds.

j. **Defining an Unknown**, or defining all unknowns, is being proactive in risk management. Unknowns include incomplete design efforts, testing not yet performed, and similar unfinished work. The challenge is to define the unknowns, identify the resources (people, funds, schedule, and tools) needed to complete the work (making them "knowns"), then monitoring

these plans to completion. Unknowns are risk areas until they are defined, the necessary actions are planned, and the required effort is found to be within the scope of technical, cost, and schedule margins.

k. **Qualified Supplier Availability** is key to keeping risk LOW. A supplier who is not experienced with the processes for designing and producing a specific product is not a qualified supplier. To qualify, a supplier requires resources that may not have been planned and therefore contain risk.

2. Risk Management Tool Box.

The Tool Box contains tools that apply to all 4 steps of the Risk Management Process. Each tool is briefly discussed below. The Tool Box is not intended to be all inclusive. Rather it provides a selection of proven tools used by similar programs. Other tools, such as those from the commercial sector, from other programs, or the software vendor community, can also support the VIRGINIA Class Program Risk Management Process. Products in the Tool Box can be obtained by contacting members of the RISK PIT.

- | |
|---|
| <p>Risk Management Tool Box</p> <ul style="list-style-type: none">• Risk Process Description• NSSL Risk Management Plan• DoD 4245.7-M Templates• NAVSO P-6071 Best Practices• Risk Indicators• Methods & Metrics for Product Success• PMWS (TRIMS), or Other Software Applications• Requirements Documents• Contracting for Risk Management• Common Risk Database• Quality Standards• Independent Risk Assessors• Risk Management Training...And More |
|---|

a. **Risk Process Description** (this document). As its name implies, this document defines the process summarized on the Risk Process Card. Changes to the process will be reflected in this document as they occur.

b. The **NSSL Risk Management Plan (RMP)** was developed to provide general guidance on risk management and to provide more specific guidance on one-time risk assessments.

c. **DoD 4245.7-M**, “Transition from Development to Production”, is often called the “Templates” book because it identifies technical risk areas and provides, in “bullet” form, suggestions for avoiding those risks. The Template Book lacks depth, but it focuses on the technical details of product design, test, and production to help managers be proactive in managing risk. The Template Book chapters describe a Design process that, for example, emphasizes understanding all the stresses that can cause the product to fail during its operating life and encourages the use of design margins to accommodate those stresses. It describes a Test process that qualifies a product to those worst case stress conditions and matures the design before it is released to production. It describes a Production process that suggests ways to replicate a qualified design efficiently. Chapters on Facilities, Logistics, and Management make this a useful tool in identifying weak areas of VIRGINIA Class Submarine planned processes early enough to implement actions needed to avoid

adverse consequences.

d. The *NAVSO P-6071 Best Practices* manual was developed by the Navy to add depth to the Template Book.

e. *Risk Indicators* are developed at the program level to measure progress toward meeting program objectives, and should be developed by each IPT for the same reasons. Risk indicators may be specification requirements, contract requirements, or measurable parameters from any agreement or tasking. The goal is to establish an early benchmark then monitor progress toward achieving program objectives.

f. *Methods and Metrics for Product Success* is a manual published by the Office of the Assistant Secretary of the Navy (RDA) Product Integrity Directorate. There are two sections of particular value. First, it contains metrics for each template in the Design, Test, and Production Chapters of the Template Book. Second, it describes the software tool, Program Manager's Work Station (PMWS). See next paragraph.

g. *PMWS (TRIMS), or Other Software Applications.* Program Manager's Work Station (PMWS) contains risk management software, "*Technical Risk Identification and Mitigation System (TRIMS)*". TRIMS is a tailorable management system based on the Best Practices Manual and the Template Book. The Methods and Metrics for Product Success manual provides a diskette which contains the necessary programs for accessing BMP◇NET from an IBM-compatible computer with a modem.

h. *Requirements Documents* describe the output of program efforts. IPT efforts need to be monitored continuously to ensure requirements are met on time and within budget. When efforts aren't, there is risk.

i. *Contracting for Risk Management* helps ensure that the organizations involved with the details of the technical processes of design, test, and production are involved with managing risk. The principle here is that those performing the technical details are normally the first ones to know when risk exists.

j. *The VIRGINIA Class Submarine Risk Database* is the central repository for VIRGINIA Class Submarine Program risk. The VIRGINIA Class Submarine Program reports MODERATE and HIGH risk to higher authority. Status of the active risk records contained in the database is tracked continuously. A risk

Risk Management Tool Box
<ul style="list-style-type: none">• Risk Process Description• NSSL Risk Management Plan• DoD 4245.7-M Templates• NAVSO P-6071 Best Practices• Risk Indicators• Methods & Metrics for Product Success• PMWS (TRIMS), or Other Software Applications• Requirements Documents• Contracting for Risk Management• Common Risk Database• Quality Standards• Independent Risk Assessors• Risk Management Training• ...And More

Risk Management Tool Box
• Risk Process Description
• NSSN Risk Management Plan
• DoD 4245.7-M Templates
• NAVSO P-6071 Best Practices
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• PMWS (TRIMS), or Other Software Applications
• Requirements Documents
• Contracting for Risk Management
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• Independent Risk Assessors
• Risk Management Training
...And More

area is placed in an *archive file* when it moves to a LOW risk category and it is tracked on at least an annual basis. Attachment A describes the purpose of the types of records used.

k. **Quality Standards**, such as *ISO9000*, *ANSI/ASQC Q 9000*, *MIL-HDBK 9000*, *MIL-Q-9858A*, and others, describe processes for developing and producing quality products. Comparing VIRGINIA Class Submarine processes with these standards can highlight areas for change to avoid risk.

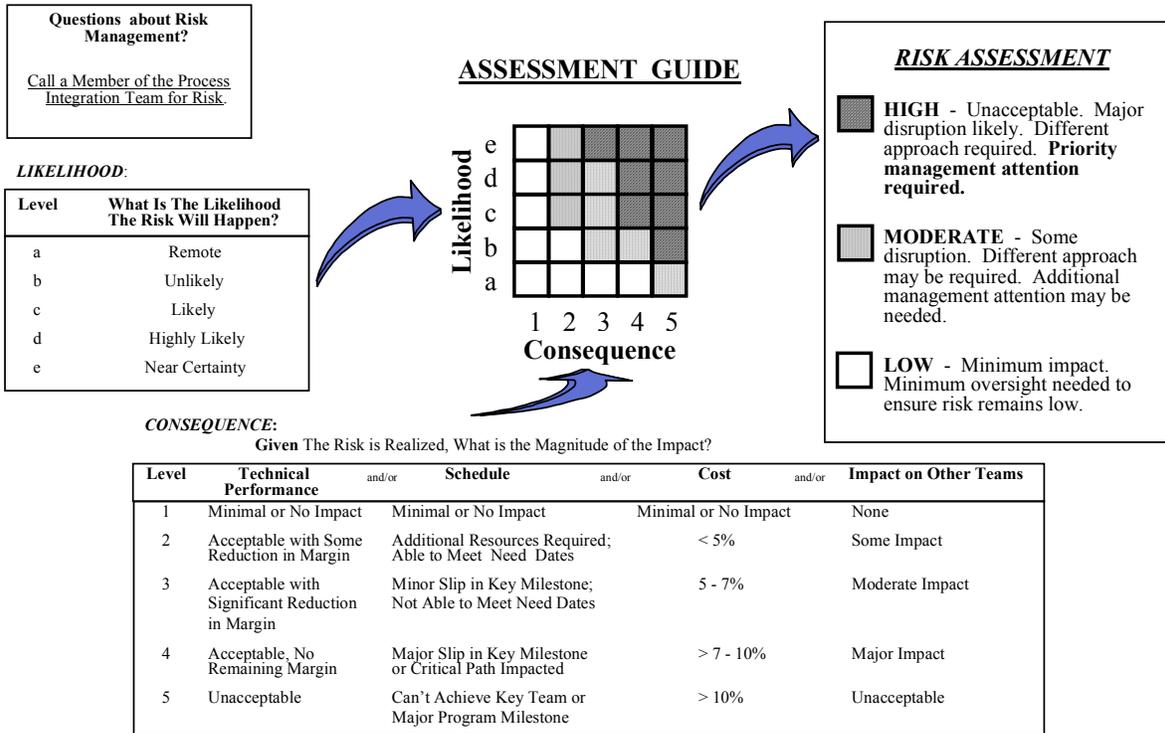
l. **Use of Independent Risk Assessors** is a tool to help ensure that all risk is identified. The knowledgeable, experienced people selected are independent from the management and execution of the processes and procedures being reviewed. Noninvolvement promotes questions and observations not otherwise achievable.

m. **Risk Management Training** is provided by the VIRGINIA Class Submarine Program Office. Future courses will be updated to reflect changes to the risk management process.

3. Output of Step 1.

Record those risk areas considered to be of highest priority. To determine whether any are MODERATE or HIGH risk, go to Step 2, "Risk Assessment".

VIRGINIA Class Submarine Risk Assessment Process



Program definition.

In considering the likelihood of the identified risk occurring, the evaluator is encouraged to review projected characteristics such as:

- Experience with subject technology (including Advance Development Models [ADMs]) and/or process
- Criticality and complexity of task relationships
- Design complexity and tolerance requirements
- Dependence upon and experience with subcontractors
- Detail of project Work Breakdown Structure (WBS) tasking.

2. Consequence.

Risk consequence is evaluated by answering the following question: “*Given the risk is realized, what is the magnitude of the impact?*” Gradations of consequence are labeled 1 through 5 and correspond to the x-axis on the assessment guide.

“Consequence” is a multifaceted issue. To assist with deciding the level of consequence, four metrics were chosen: *i.e.*, Technical Performance, Schedule, Cost, and Impact on Other Teams. At least one (maybe more) of the four consequence metrics needs to apply for there to be risk. However, if there is no adverse consequence, there is no risk.

CONSEQUENCE Given The Risk is Realized, What is the Magnitude of the Impact?				
Level	Technical Performance	and/or Schedule	and/or Cost	and/or Impact on Other Teams
1	Minimal or No Impact	Minimal or No Impact	Minimal or No Impact	None
2	Acceptable with Some Reduction in Margin	Additional Resources Required Able to Meet Need Dates	< 5%	Some Impact
3	Acceptable with Significant Reduction in Margin	Minor Slip in Key Milestone; Not Able to Meet Need Dates	5 - 7%	Moderate Impact
4	Acceptable, No Remaining Margin	Major Slip in Key Milestone or Critical Path Impacted	> 7 - 10%	Major Impact
5	Unacceptable	Can't Achieve Key Team or Major Program Milestone	> 10%	Unacceptable

a. **Technical Performance:** The intent of this metric is to include all requirements not included in the other three metrics of the Consequence Table. The wording of each level is oriented toward design processes, but it should be applied as well to test processes, production processes, life cycle support, and to ship disposal. For example, the word “margin” could apply to weight margin during design, safety margin during testing, or machine performance margins during construction and subsequent life cycle operation.

b. **Schedule:** The words used in the *Schedule* column, as in all columns of the Consequence Table, are meant to be generic.

Avoid excluding a consequence level from consideration just because it doesn't match a team's specific definitions.

c. **Cost:** Since the magnitude of the dollars varies from component to component and process to process, percentage of dollars is used. There has been an attempt, however, to align these definitions with standard cost reporting requirements consistent with cost consequences faced at the IPT level. [However, when costs are rolled up at higher levels (e.g., Program), the following definitions are recommended: Level 1 - Minimal or No Impact, Level 2 - <2%, Level 3 - 2-4.9%, Level 4 - 5-10%, and Level 5 - >10%.]

d. **Impact on Other Teams:** Both the consequence of a risk and the mitigation actions associated with reducing risk may impact another team. When this impact results in increased complexity, levels of risk also increase. This may involve additional coordination or management attention (resources) and may therefore increase the level of risk.

3. Assessment Guide.

e					
d					
c					
b					
a					
	1	2	3	4	5
	Consequence				

After deciding a level of likelihood (a through e) and a level of consequence (1 through 5), enter the Assessment Guide table to obtain a level of risk (green = LOW, yellow = MOD, and red = HIGH). For example: likelihood/consequence level b2 corresponds to LOW risk, level d3 corresponds to MOD risk, and level c4 corresponds to HIGH risk. After obtaining the level of risk from the Assessment Guide, compare the level of risk with the applicable definition in the Risk Assessment. There should be a close match. If there isn't, consider reevaluating the level of likelihood and/or consequence.

<u>RISK ASSESSMENT</u>	
	HIGH - Unacceptable. Major disruption likely. Different approach required. Priority management attention required.
	MODERATE - Some disruption. Different approach may be required. Additional management attention may be needed.
	LOW - Minimum impact. Minimum oversight needed to ensure risk remains low.

4. Output of Step 2.

Those risk areas identified in Step 1, which were assessed as MODERATE or HIGH in Step 2, should be submitted without delay, in any convenient format, to the appropriate PMS450 Risk Area Manger or it should be entered directly into the Risk Database. See Attachment A for more detailed procedures for submitting and statusing risk. The VIRGINIA Class Submarine

On Line Risk Database (OLRDB) User's Guide contains detailed instructions for adding, deleting, or changing data in the On Line Risk Database.

A new risk area may be added to the VIRGINIA Class Submarine OLRDB before the more time consuming process of developing approved risk mitigation plans (Step 3 below). Mandatory OLRDB fields for adding a new risk record are:

- Risk Title
- Team Name
- Risk Description
- Likelihood
- Consequence
- Reviewer

Step 3 - RISK ANALYSIS AND MITIGATION

1. Analysis and Mitigation.

What Can You Do About A Risk?
Develop Backup Plans
Parallel Paths
Redesign
Develop Prototypes
Renegotiate Requirement
Acquire Resources
 – Technology
 – People
 – Equipment
Accept the risk level, and continue your current plan
...And More

Develop specific tasks that, when implemented, will reduce the stated risk to an acceptable level. Describe what has to be done, the level of effort, and the material or facilities required. Provide a proposed schedule to accomplish the actions and, if possible, provide a cost estimate. List all assumptions used in the development of the mitigation plan. Recommended mitigation actions that require resources outside the scope of a contract, Ship Project Directive (SPD), Work Request (WR), or other official tasking should be clearly identified. List the IPTs the risk area or the mitigation plans may impact. Forward the information to the Risk Area Manager per the Attachment A instructions or put the information directly into the risk database per the OLRDB User's Guide.

2. Use of Tool Box Items in Developing Mitigation Plans.

The RPC lists some ideas for developing risk mitigation plans that are self-explanatory. Two items listed in the **Tool Box**, "DoD 4245.7-M Templates" and "NAVSO P-6071 Best Practices", are often useful in developing mitigation plans for design, test, or manufacturing risk areas. The idea "Renegotiate Requirements" should normally be recommended as a last resort.

3. Output of Step 3.

The output of Step 3 is the addition of mandatory field information required to add mitigation plans to the new risk record added in Step 2. Those additional mandatory fields, for each mitigation plan, are:

- Short Description (of the Mitigation Plan)

- Mitigation Plan
- Estimated Completion Date

Step 4 - Risk Tracking

1. Monitor and Evaluate Mitigation Plans.

MODERATE and HIGH risk areas are reported to the Risk Area Manager (RAM), per Attachment A, and entered into the VIRGINIA Class Submarine Risk Database. See Attachment B for an example of a risk record from the database. Risk is tracked per Attachment A and the risk database is updated per the OLRDB User’s Guide. When risk becomes LOW it is changed from an “Active” to an “Archive” record. These archived Risk records should be updated/reviewed on at least an annual basis. Active records (MODERATE and HIGH) must be updated at least quarterly.

Generally, the IPT that initially reported the risk area retains cognizance (ownership) for reporting status unless otherwise directed by the RAM or the Reviewer. Ownership means implementing plans for mitigating the risk and providing periodic status of risk and the mitigation plans. The responsibilities of the RAM and Reviewer in the overall risk work flow process are described in Attachment A

Progress Mitigation Plans
 Update Common Risk Database
 Communicate Risk:
 • Customers
 • Suppliers
 • Management
 Use Lessons Learned
 Note that Low Risk Items will not be tracked at Program Office Level

Risk should be made an agenda item at each management or design review. Openly discussing risk provides an opportunity for all concerned to offer suggestions for the optimum approach to reducing risk to an acceptable level. Communicating risk improves VIRGINIA Class Submarine credibility and allows early actions to minimize adverse consequences.

From Step 4, the RPC shows an arrow returning to Step 1 denoting a continuous process as opposed to a continuous loop. Thus the arrow could just as well return to Step 2 denoting the reprioritizing of a risk area, or to Step 3 denoting a need to modify the risk mitigation plans. To keep the RPC less complicated, reassessing the level of risk and rethinking risk mitigation plans are considered an inherent part of Step 4.

2. Provide Risk Status.

Report status of the risk item and its mitigation actions to the RAM continuously. As a minimum, report status:

- a. Quarterly,

b. When the status of the risk area has changed significantly (as a minimum when the risk changes from HIGH to MODERATE to LOW, or vice versa), or

c. When requested by the RISK PIT. Provide risk status per Attachment A.

When providing status of a mitigation plan, provide a reference for documents that describe completed actions.

3. Updating the Database.

There will be a database Configuration Control Board (CCB) that will consist of representatives as denoted in the Virginia Class Risk PIT meeting minutes. The CCB and Risk PIT Leader will approve changes in functionality to the On Line Risk Database (OLRDB) or its successor.

The RISK PIT Team has made additional decisions on updating the Risk Database. They are:

a. A designated PMS450 **Risk Area Manager** will be responsible for each risk area.

b. **Changes to the “risk description”** should be limited to corrections or clarifications to the original description only. A significant difference in risk description should be considered a candidate for reporting a new risk area.

As a general rule any **risk description** which has been entered into the Risk Database, and reported to a higher authority, must be retained. The close out of each risk area will be based on the merit of the status of associated mitigation actions.

c. **Significant changes in the risk** record, such as changes to the level of risk, must include a justification. A risk record changed to LOW will be made an Archive Record if approved by the Reviewer per procedures contained in the OLRDB User’s Guide. When recommending that a risk area be changed to LOW, provide a rationale with references.

d. **Mitigation Plans.** Reordering the risk mitigation actions or adding additional actions are both considered acceptable without reporting it as a new risk area.

Completing all risk mitigation actions may mean that new risk mitigation actions may have to be provided if the completed actions have not provided the desired results and the risk area

cannot be reduced to LOW.

Each new mitigation plan should contain a tracking number (e.g., commitment number of ARTEMIS activity number) when the activity uses a separate database or system to track the mitigation plan status. In the case of Lockheed Martin Federal Systems (LMFS), for C3I Systems, the LMFS internal risk area number is satisfactory for use as the tracking number. If the activity doesn't use a separate tracking database or system, putting a tracking number in the mitigation plan is not required.

Each month, RAMs and Risk PIT Leaders will be notified of overdue Estimated Completion Dates (ECDs) and ECDs coming due within 30 days.

e. **Emerging Risk.** Options available to the Risk Area Manager, when confronted with emerging risk related to a risk record already in the Database, include:

(1) Use the Risk Process Card to determine whether the emerging risk is a MODERATE risk in its own right. If so, make it a new risk in the Database.

(2) If the emerging risk is below the criteria for a new MODERATE risk, the following alternatives are available:

- If the emerging risk can be considered closely related to a part of the originally described risk area, add mitigation plans as appropriate to reduce the overall risk, and state rationale (and emerging risk) in the status field. Report status on both the original and new mitigation plans.
- If the emerging risk is an out growth of implementing a mitigation plan, and the actions needed to mitigate the emerging risk are generally within scope of the mitigation plan, state the emerging risk in the status field along with what is planned to be done to reduce it.

If the emerging risk can be considered to be distinct from the originally described risk area, treat the emerging risk area as any other LOW risk. The accumulation of several emerging risk areas could, when taken together, meet the criteria for MODERATE risk. At that point make it a new risk area.

f. **Database Update.** Key activities should continuously

provide new risk, and update status of existing risk records, to the PMS450 Risk Area Managers. Updates are particularly important just prior to Risk PIT meetings for incorporation into the Quarterly Risk Status Reports.

4. Output of Step 4.

Risk reports to management are often “rolled up” by various methods. NSSL risk has been reported according to the Templates of DoD Manual 4245.7-M, the old DoD 5000.2 risk areas, and more recently by the Defense Acquisition Executive Summary (DAES) Categories. A map of these 3 categories of risk is provided in Attachment C as an aide to those who need to make a risk category selection. Often, however, a risk record could have consequences in more than one category. The risk database provides for multiple selections. A sample Quarterly Risk Status Report is contained in Attachment D.

The Risk Process Integration Team’s MAIT Representative will provide a Risk PIT input to the Weekly MAIT Report.

The VIRGINIA Class Risk Management Organization

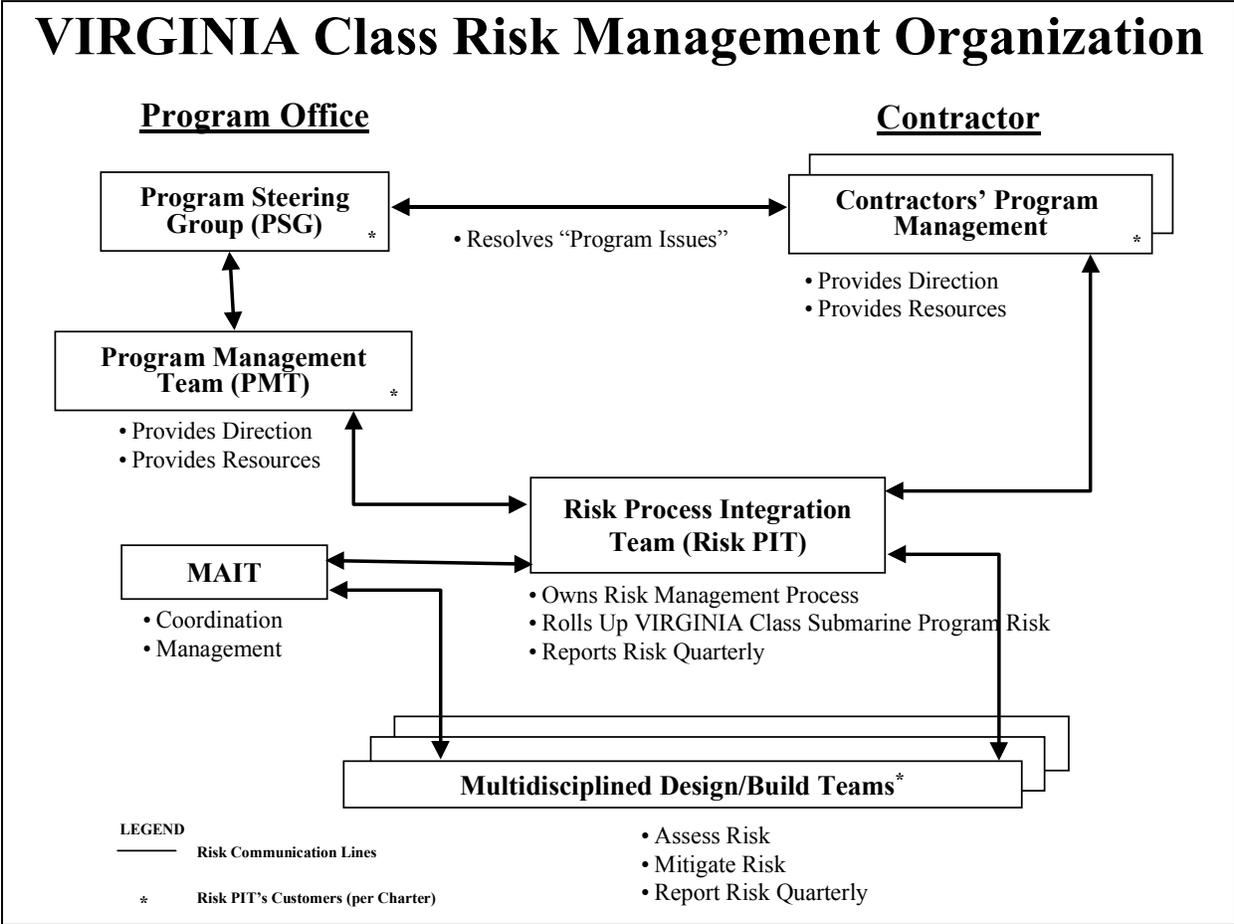


Figure 3: Organizational Relationships

1. Organizational Relationships.

The organizational relationships shown in Figure 3 are based on the approved Risk PIT Charter. The Risk PIT consists of members representing VIRGINIA Class Submarine major contractors and the Navy Program Office. The Team reports to and receives direction from both Navy and contractor Program Managers. The multi-disciplined IPTs report risk to a PMS450 individual who enters the risk into the Risk Database and assumes Risk Area Manager responsibilities per Attachment A. The Risk PIT provides risk process guidance to the IPTs. The Major Area Integration Teams (MAITs) help the Risk PIT resolve risk issues. The Navy Program Steering Group (PSG) resolves “Program Issues” with the Contractor’s Program Manager. Program issues are those issues too broad in scope to be handled by the Risk PIT and the multidisciplined IPTs.

2. Integrated Process Team Responsibilities.

Each IPT should consider the following as inputs to their own Charter in order to support the VIRGINIA Class Submarine Risk Management Process:

- a. Proactively identify, assess, and report new risk areas to the MAIT.
- b. Continuously track status of risk mitigation plans and report status when requested to the MAIT.
- c. Conduct special risk assessments when requested by the MAIT, Risk PIT or VIRGINIA Class Submarine Program Management.
- d. Designate a point of contact within the Team for managing risk.
- e. Designate Team personnel to receive risk management training and to keep abreast of changes to the VIRGINIA Class Submarine Risk Management Process.
- f. Utilize tools, training, and facilitator services provided by the Risk PIT to proactively identify risk, develop risk mitigation plans, and report risk status.

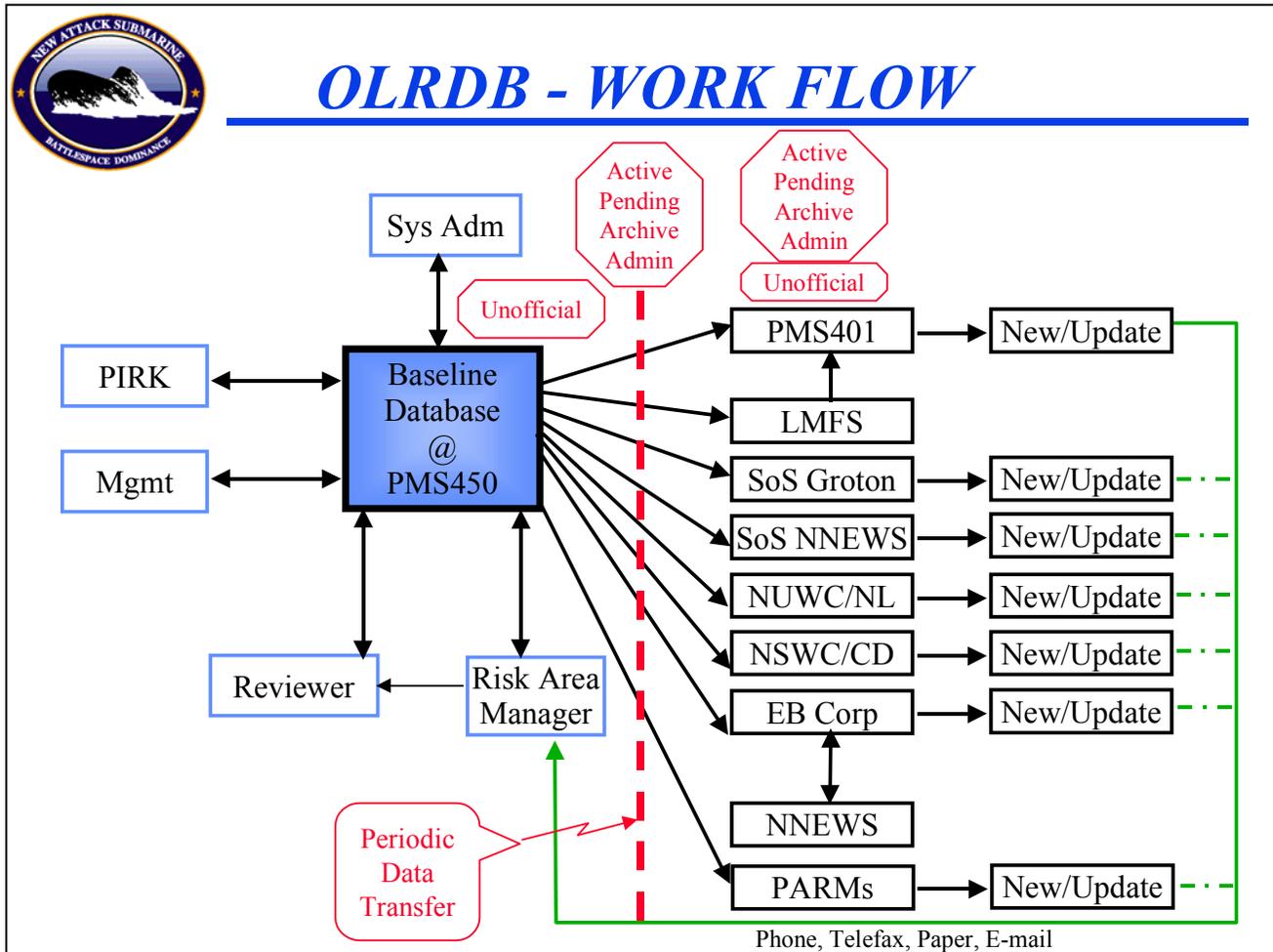
3. Risk Process Integration Team (RISK PIT).

Attachment A lists the names and phone numbers of current Risk PIT members who can answer questions about the VIRGINIA Class Submarine Risk Management Process. Also, call them if you have any ideas for making the process better. Risk PIT responsibilities were discussed in the Introduction and graphically represented in Figure 3.

Attachment E contains a list of acronyms.

Procedures for Submitting and Statusing VIRGINIA Class Risk

Background: The Risk Process Integration Team (Risk PIT) Charter requires providing a Quarterly Risk Status Report. The report includes new risk areas as well as status of risk being tracked in the VIRGINIA Class Risk Database. The workflow for submitting either new risk, or risk status, using the **On-Line Risk Database (OLRDB)**, appear below. Procedures for using the OLRDB are found in the OLRDB User's Guide.



Background/Definitions/Duties

The OLRDB replaced the Common Risk Database (CRD) on 20 December 1996. The CRD was a Word 6.0 table containing essentially the same information and was maintained by a database administrator. The OLRDB is maintained on the PMS450 LAN by PMS450 Staff.

Five Risk Record Types in the OLRDB are: **Active** (all MODERATE and HIGH risk), **Archive** (all risk transitioned to LOW from MODERATE or HIGH), **Admin** (all risk that was canceled, replaced by another risk area, or was overtaken by events; it never has to be reviewed again.), **Pending** (a new risk record awaiting activation by a "Reviewer"), and **Unofficial** (never gets reported, no mandatory entries, intended for use as an individual manager's tool, can be changed to Pending by the person who entered it into the OLRDB).

Risk Area Manager (RAM) enters new risk into the OLRDB and is responsible for keeping the database current with respect to status of the mitigation plans. Has primary cognizance of the content of the risk record.

Reviewers are selected by the RAM for new MOD or HIGH risk. The reviewer approves or comments on the RAM's Pending record. Once all issues between the Reviewer and RAM are resolved, the Reviewer changes the record type to "active". The six reviewers are:

1. Mike Brown, PMS450T1FWD, for FORWARD design items.
2. LCDR Rick Seraiva, PMS450T1AFT, for AFT design items.
3. CDR Marsden Davis, PMS450EC, for C³I System items.
4. Larry Becker, PMS450T4B, for R&D items.
5. Dave Ungar, PMS450C1, for Construction related items.
6. Dave Restifo, PMS450TL, for Logistics related items.

Additionally, members of the Program Steering Group have write authorization of a Reviewer in the OLRDB.

OLRDB User's Guide provides guidance for HOW to use the OLRDB as installed on the PMS450 LAN. It is considered a companion to this Risk Process Description.

Overview - Risk Process Workflow

Use the Risk Process Card (RPC) and this RPD to help determine if a risk area is MOD or HIGH. If it is, continue. If not, no further reporting action is required.

Open the OLRDB and add the MOD or HIGH risk as a new record per the OLRDB User's Guide.

Status of active risk records should be kept up-to-date continuously; at least quarterly. Archive records (LOW risk) must be updated at least annually.

The shaded box, in the OLRDB - WORK FLOW figure above, represents the OLRDB as installed on the PMS450 LAN. That database will be exported periodically to the key activities.

The **cognizant personnel** at the key activities should review the database and **provide updates**, consisting of new risk records or status of existing risk records, **to the RAM at PMS450**.

New risk and risk status must be received from the key activities by the PMS450 RAM no later than 2 weeks before the next scheduled, quarterly VIRGINIA Class Risk Management Team meeting.

Risk PIT Members: Call one of the following for assistance:

LDCR Hooker	202-781-1566	PMS450 RISK PIT Co-Ldr/PMT	hookerdt@navsea.navy.mil
Rich Wong	202-781-1166	PMS450 RISK PIT Co-Ldr/MAIT	wongrj@navsea.navy.mil
Mark Basilica	202-781-1207	PMS450EB	basilicam@navsea.navy.mil
Dick Clarke	202-781-1596	PMS450A2	clarkerw@navsea.navy.mil
Sara Jane Milici	202-781-1391	PMS450C2	milicisj@navsea.navy.mil
Larry Becker	202-781-5590	PMS450T4	beckergl@navsea.navy.mil
Kevin Cronin	401-832-8119	PMS450C2N	croninkm@npt.nuwc.navy.mil
Tom Stevenson	202-264-7850	PMS450TL Rep	tstevenson@egginc.com
Brian Neske	202-78101348	PMS4011	neskebj@navsea.navy.mil
Jon Erickson	860-433-3853	SUPSHIP Groton	ericksonjj@supship.navy.mil
LCDR Rick Hartman	757-380-3675	SUPSHIP NNews	hartmanrm@supship.navy.mil
John Consiglio	860-433-6527	EBC, Ship Systems	jconsigl@ebmail.gdeb.com
Roman Steblecki	860-433-7009	EBC, C ³ I	rsteblec@ebmail.gdeb.com
Doug Eliot	860-433-2852	EBC	deliot@ebmail.gdeb.com
Denise Saiki	703-367-3549	LM NE&SS	denise.saiki@lmco.com
Tom Ward	757-380-7180	NNS	ward_tc@nns.com
Skip Bush	202-262-7822	Risk Facilitator/Trng/Tm Secretariat	sbush@egginc.com
Hal Freed	202-264-7820	Risk Facilitator	hfreed@egginc.com

Sample Record from Risk Database

Date Printed: 03/04/1997

Page 1

Risk Area #:	91	NSSN WBS:	000	RAM:	JIMMY SMITH
Record Type:	ACTIVE	Contr. WBS:		RAM Tel:	703-602-0011x138
Date Reported:	10/08/1996	DAES Cat.:	COST	RAM E-mail:	smith_jimmy@hq.navy.mil
Date Activated:	10/08/1996	5000.2 Cat.:	COST	RAM Team:	ENVIRONMENTAL PIT
Close Date:	/ /				
Const. Related:	Yes	Cog. Risk PIT :	LCDR JEFF STETTLER		

WBS = Work Breakdown Structure RAM = Risk Area Manager DAES = Defense Acquisition Executive Summary

Risk Title:	OSHA's Hexavalent Chromium Permissible Exposure Limits (PEL) Reduction
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Risk Description:
 Added 9/9/96, Activated 10/8/96. Technical and economic impact will result from OSHA's proposed reductions in worker permissible exposure limits (PEL) for Hexavalent chromium (Cr(VI)). Proposed 8-hour time-weighted-average PEL expected to drop from present 100 micrograms/m3 to between 0.5 and 5.0 micrograms/m3 sometime in Sept 1997.

The following operations have the potential for worker exposure to Cr(VI): Metal Cleaning of chromate coated materials. - Electroplating of chromium. - Painting and application of chromate paints and coatings. - Welding, thermal spraying, thermal cutting, and gouging on base materials and with consumables containing chromium.

Cost Impact Value:	0.0	Affected Budget:	
Schedule Impact Value:	0	Impacted Milestone:	

Risk Assessment Level:	HIGH		
Likelihood:	C	Notes:	
Consequence:	5	Notes:	
Previous Assessment Level:		Assessment Change Date:	10/08/1996
Assessment Change Justification:			

Risk Mitigation Plan(s)

Risk Area #:	91	Mit Plan #:	1	Entry Date:	10/08/1996	
Mit Plan:	1. EB and NNS are both working tasks to develop shipyard mitigation plans to reduce the associated increased costs impact due to the proposed OSHA Cr(VI) reduction requirement. Tasking results will identify viable alternative welding processes and material substitutions that could be employed in order to reduce personnel exposure to Cr(VI). These tasks are due to wrap up in the March/April 1997 timeframes.				ECD:	04/30/1997
	Support a Navy/Industry Task Group on Cr(VI). This includes financial support and such efforts as collecting additional statistically valid worker exposure characterizations.					
Short Desc.:	Mitigation Planning - EB and NNS			Mit Plan Date:	02/12/1997	
Cog. POC:	JIMMY SMITH	POC's Org.:	PMS450			
Cog. Phone:	602-0011x138	Cog. Team:	E PIT			
Need Date:	/ /	Dependent Activity:				
Status:	Ongoing. ECD = 4/30/97.					
Status Date:	02/12/1997	Completion Date:	/ /			

Risk Area #	91	Mit Plan #:	2	Entry Date:	10/08/1996	
Mit Plan:	Collect published Cr(VI) epidemiological and toxicological data to support training and to support possible requests for additional program funding.				ECD:	12/31/1998
Short Desc.:	Mitigation Planning - EB and NNS			Mit Plan Date:	10/08/1996	
Cog. POC:	JIMMY SMITH	POC's Org.:	PMS450			
Cog. Phone:	602-0011x138	Cog. Team:	ENVIRONMENTAL PIT			
Need Date:	/ /	Dependent Activity:				
Status:	ECD = 12/98					
Status Date:	10/08/1996	Completion Date:	/ /			

Risk Area #	91	Mit Plan #:	3	Entry Date:	10/08/1996
Mit Plan:	Navy/Shipbuilder(s) develop/finalize long range exposure reduction plans, pending the outcome of the OSHA ruling during 9/97.			ECD:	09/30/1998
Short Desc.:	Navy/Shipbuilder(s) develop/finalize long range			Mit Plan Date:	02/12/1997
Cog. POC:	JIMMY SMITH	POC's Org.:	PMS450		
Cog. Phone:	602-0011x138	Cog. Team:	E PIT		
Need Date:	/ /	Dependent Activity:			
Status:					
Status Date:	02/12/1997	Completion Date:	/ /		

Risk Area #	91	Mit Plan #:	4	Entry Date:	10/08/1996
Mit Plan:	Implement contractual modifications to address final, published OSHA Cr(VI) PEL.			ECD:	12/31/1998
Short Desc.:	Identify and implement contractual modifications			Mit Plan Date:	02/12/1997
Cog. POC:	JIMMY SMITH	POC's Org.:	PMS450		
Cog. Phone:	602-0011x138	Cog. Team:	E PIT		
Need Date:	/ /	Dependent Activity:			
Status:	ECD = 12/99				
Status Date:	10/08/1996	Completion Date:	/ /		

Risk Area #	91	Mit Plan #:	5	Entry Date:	10/08/1996
Mit Plan:	Implement long range exposure reduction plans, pending OSHA ruling. OSHA ruling expected in 9/97.			ECD:	12/31/1998
Short Desc.:	Implement long range exposure reduction plans.			Mit Plan Date:	02/12/1997
Cog. POC:	SHIPBUILDERS	POC's Org.:			
Cog. Phone:	/ /	Cog. Team:			
Need Date:	/ /	Dependent Activity:			
Status:	ECD = 12/98, coinciding with full implementation in 2000.				
Status Date:	12/09/1996	Completion Date:	/ /		

Risk Area #	91	Mit Plan #:	6	Entry Date:	10/08/1997
Mit Plan:	Collaborate with Navy pollution prevention R&D efforts related to processes involving Cr(VI).			ECD:	09/30/2001
Short Desc.:	Collaborate with Navy pollution prevention R&D			Mit Plan Date:	10/08/1996
Cog. POC:	JIMMY SMITH	POC's Org.:	PMS450		
Cog. Phone:	602-0011x138	Cog. Team:	E PIT		
Need Date:	/ /	Dependent Activity:			
Status:	ECD = 9/01				
Status Date:	10/08/1996	Completion Date:	/ /		

ECD = Estimated Completion Date

POC - Point of Contact

Reviewer Name:	CDR MARC STEWART	Phone:	703-602-0017x140		
Reviewer E-mail:	stewart_marc.cdr@hq.navsea.navy.mil				
Reviewer Request:	NO	Reason:			
Date Requested:	/ /	Comments:			

Reviewer = Approves moving risk from a pending to an active record; approves changes to level of risk and other "significant" changes in status.

Other Notes:

Map of DAES Categories, Functional Areas, and Templates

DAES Categories	DoD 5000.2 Functional Risk Areas	DoD Templates
Cost Performance	Cost	None
Contracts	None	None
Funding	Funding	Money Phasing
Schedule	Schedule	None
	Schedule Concurrency	None
Performance Characteristics	Design & Engineering (Hardware)	Design Reference Mission Profile
		Design Requirements
		Trade Studies
		Design Policy
		Design Process
		Design Analysis
		Parts and Materials Selection
		Computer Aided Design
		Design for Testing
		Built-in-Test
	Design & Engineering (Software)	Configuration Control
		Design Reviews
		Design Release
		Integrated Test
		Failure Reporting System
		Design Limit (test)
		Life (test)
		Test, Analyze & Fix (TAAF)
		Transition Plan
		Data Requirements
	Technology	Technical Risk Assessment
		Software Design
	Threat	Software Test
		None
	Human Systems Integration	None
		None
		None
	Environmental Impact	None
		None
Management Structure	None	Total Quality Management
Integrated Logistics Support	Support	Logistics Support Analysis

DAES Categories	DoD 5000.2 Functional Risk Areas	DoD Templates
Production	Manufacturing	Manpower & Personnel Support & Test Equipment Training Materials & Equipment Spares Technical Manuals Manufacturing Plan Qualify Manufacturing Process Piece Part Control Subcontractor Control Defect Control Tool Planning Special Test Equipment (STE) Computer-Aided-Manufacturing Manufacturing Screening Modernization Factory Improvements Productivity Center Manufacturing Strategy Personnel Requirements Production Breaks
Test & Evaluation	None	Uniform Test Report Field Feedback

Note: (1) Templates listing is per DoD 4245.7-M
 (2) Functional Areas listing is per DoD 5000.2-M, Part 4, Section E

SAMPLE

PROCESS INTEGRATION TEAM FOR RISK (Risk PIT)

VIRGINIA Class QUARTERLY RISK STATUS REPORT # 15

Date: 1 September 1999

Items requiring management attention:

High Risk Items:

DAES Cat.	Risk Area (No.)	Status
PERF	RLGN's Inertial Measurement Unit (IMU) Structureborne Noise (184)	See Attachment 1 for details.
COST	Non-Propulsion Electronic System Engineering & Integration (186)	See Attachment 2 for details.
SCHED	Lightweight Planer Array/Lightweight Wide Aperture Array (187)	See Attachment 3 for details.
PERF	NPES not ready for COATS; Lack of coordination between CWITT, NPES SE&I, and S/CC/A regarding plans for COATS could lead to ineffective test/integration program. (196)	See Attachment 4 for details.

Significant Changes to Known Risk Areas:

DAES Cat.	Risk Area (No.)	Previous Assessment	Current Risk Assessment	Justification
ILS	Vendor Industrial Base may not be viable to maintain fleet support for HM&E items without transitioning to the Extended Enterprise program. (022)	MOD	LOW	The number of submarines that are being procured has helped stabilize the industrial base.
SCHD	RO System development schedule to meet required in yard need dates requires start	LOW	MOD	This risk was moved to "LOW" before qualification (shock, acoustic, etc.) was completed.

DAES Cat.	Risk Area (No.)	Previous Assessment	Current Risk Assessment	Justification
	of manufacturing prior to completing qualification tests. (54)			
COST	Teaming Cost Estimates are dependent on shipbuilders' detailed plans for splitting the work. (120)	MOD	LOW	These effects have been taken care of by the contract for the first four submarines.
SCHD	Seawolf Ship Control Code Reuse is complicated by lack of documentation and may impact cost and schedule. (164)	MOD	ADMIN	Mitigation plans have been accomplished with the identification/selection of reusable SEAWOLF logic and the availability of Navy resources. There is no further code or logic reuse from SEAWOLF software for VIRGINIA.
FUND	Lack of insurance spares and components may result in Commissioned Ship Prolonged Non-Ready Status. (176)	HIGH	MOD	Management confidence that funding will be provided changed when the Likelihood changed from Highly Likely to Unlikely. Funding for insurance spares and components was previously planned for by N87 but needed to be pulled back for other unexpected expenses.
SCHD	JMCIS (Joint Maritime Command Information Strategy) and Advanced Tomahawk Weapon Command System (ATWCS) Interfaces may not change from point to point to network in time to support goal system design. (179)	MOD	ADMIN	The content of Risk Record 179 has been split to keep technical and management issues of independent program activities separated. Risk Records 192 and 193 supercede 179.
SCHD	Weapons Simulator Schedule Risk. (190)	HIGH	MOD	Development is almost complete.

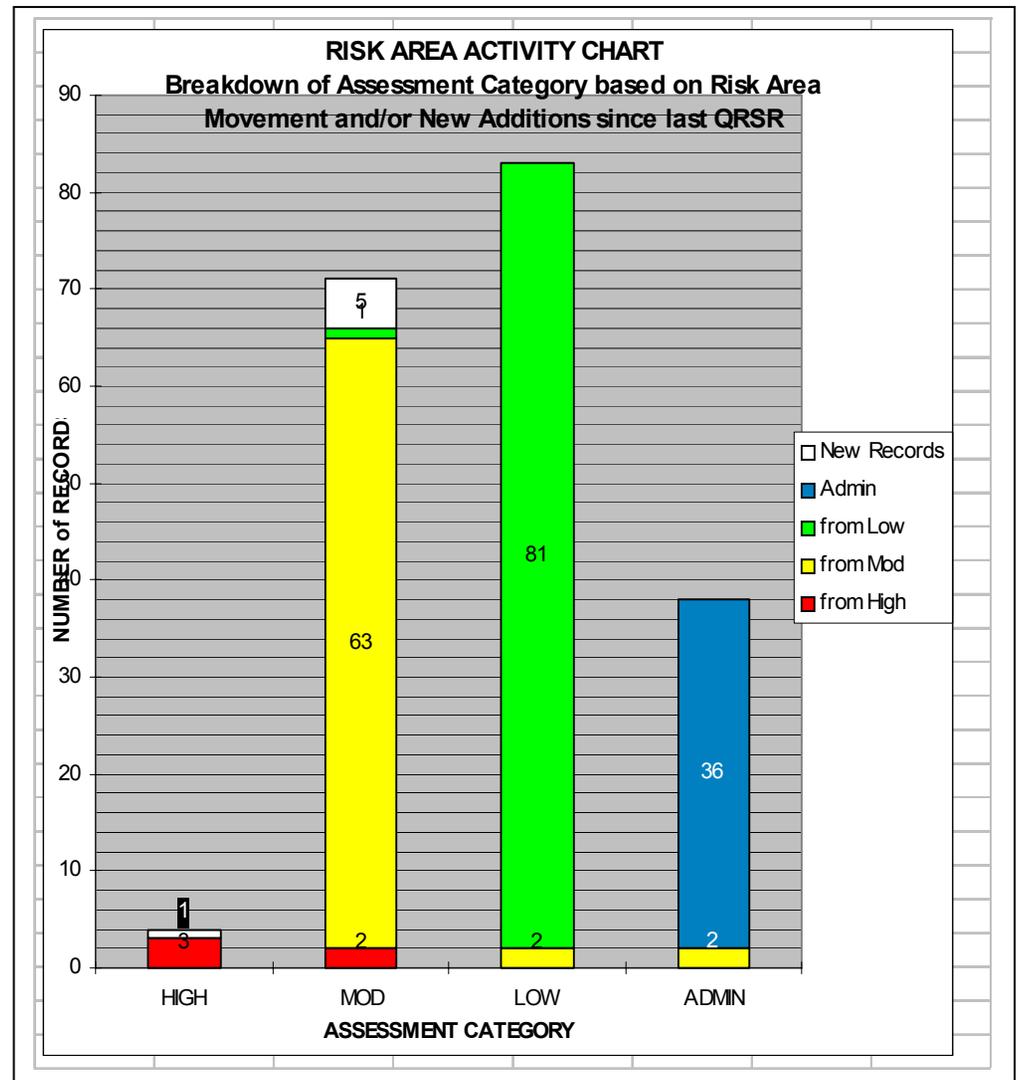
New Risk Areas: (Moderate or High)

DAES Cat.	Risk Area (No.)	Risk Assessment	Mitigation Plan Summary
COST	Configuration Management and Status Accounting of Commercial Off The Shelf (COTS) Products (191)	MOD	(1) Audit Configuration Management Process Compliance. (2) Optimize Component Commonality and Design Simplification. (3) Ensure COTS CM/CSA is adequately addressed in class technology refreshment and technology insertion management plans.
SCHD	Global Command and Control System-Maritime (GCCS-M) Tactical Interface Transition Risk. (192)	MOD	(1) Obtain Requirements from GCCS-M Program. (2) Develop NPES POAM for GCCS-M Workstation interface. (3) Establish NPES splinter group to determine best approach to support requirements and implement solution for Virginia Class.
COST	Tactical Tomahawk Weapon Control System (T-TWCS) Tactical Interface Transition Risk. (193)	MOD	(1) Obtain Requirements and System Schedule from T-TWCS Program. (2) NPES POAM to document proposed T-TWCS interface and security requirements for SSN 774 PSA. (3) Establish NPES Splinter Group to determine best approach to support requirements and implement solution.
COST	Shock/Vibration Testing of Remote Interface Controller (RIC) Variants. (194)	MOD	Develop recommended approach for shock/vibration testing all of the RIC variants. Investigate the possibility that the shock/vibration qualification of one or more of the RIC configurations may be extended to other configurations in an effort to reduce cost impacts.
COST	Shock/Vibration Testing of Ship Control (SC) Linear Displacement Transducers (LDT). (195)	MOD	Develop recommended approach for shock/vibration testing both LDT mounting configurations. Investigate the possibility that the shock/vibration qualification of one LDT mounting configuration may be extended to the other in an effort to reduce cost impact.
PERF	NPES not ready for COATS; Lack of coordination between CWITT, NPES SE&I, and S/CC/A regarding plans for COATS could lead to ineffective test/integration program. (196)	HIGH	(1) Establish a COATS Readiness Team. (2) Coordinate/Realign PMS450 plans to ensure the S/CC/A and ESM System support required functionality and delivery schedules to COATS.

Risk Database Metrics:

<u>Risk</u>	<u>4/95</u> <u>MS II</u>	<u>3/99</u> <u>QRSR # 13</u>	<u>5/99</u> <u>QRSR # 14</u>	<u>8/99</u> <u>QRSR # 15</u>
HIGH	3	3	5	4
MOD	68	79	65	71
LOW	0	75	84	83
ADMIN*	0	30	36	38

* The Admin File contains records closed for reasons other than moving to LOW risk. See Risk Process Description. These records need not be reviewed again.



Significant Events:

1. The annual Risk Management Training Course is planned for 5 October in Arlington, Virginia.

Submitted:

/S/

LCDR Jim Chisum

Risk PIT Co-Team Leader

/S/

Dave Ungar

Risk PIT Co-Team Leader

Attachments:

1. High Risk Status - RLGN's IMU Structureborne Noise
2. High Risk Status - NPES SE&I
3. High Risk Status - LWPA/LWWAA
4. High Risk Status – NPES Not Ready for COATS

List of Acronyms

ADM	Advance Development Model
ANSI	American National Standards Institute
ASQC	American Society for Quality Control
BMP	Best Manufacturing Program
BMP \diamond NET	Best Manufacturing Program - Network [a software program]
C ³ I	Command, Control, Communications, and Intelligence
COTS	Commercial Off-The Shelf
DAES	Defense Acquisition Executive Summary
D/BTs	Design/Build Teams
DoD	Department of Defense
EBC	Electric Boat Corporation
ECD	Estimated Completion Date
IPPD	Integrated Product and Process Development
IPT	Integrated Product Team
ISO	International Standards Organization
LMFS	Lockheed Martin Federal Systems
MAITs	Major Area Integration Teams
MAT	Major Area Team
MIL-HDBK	Military Handbook
MIL-Q	Military Qualifications
MOD	Moderate (Risk assessment)
NAVSEA	Naval Sea Systems Command
NAVSO	Department of Naval Staff Office
NSSN	New Attack Submarine
OLRDB	On Line Risk Database
OSHA	Occupational Safety and Health Administration
PARM	Participating Acquisition Manager
PEL	Permissible Exposure Limit
RISK PIT	Risk Process Integration Team
PIT	Process Integration Team
PMS	Program Manager Ships
PMWS	Program Manager's Work Station
PMT	Program Management Team
PSG	Program Steering Group
RAM	Risk Area Manager
RDA	Research Development & Acquisition
RMP	Risk Management Plan
RPC	Risk Process Card
RPD	Risk Process Description
SIT	System Integration Team
SPD	Ship Project Directive
TRIMS	Technical Risk Identification and Mitigation System
WBS	Work Breakdown Structure
WR	Work Request