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Russian Navy Fresh Fuel MPC&A Training and Regulations

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Abstract

The Regulations and Training Projects are part of the U.S.-Russian Federation Materials Protection, Control, and Accounting (MPC&A) cooperative program to protect Russian Navy Fuels. This paper describes the general status of the projects, progress achieved to date, and long-term plans for further work in producing regulatory documents and training to support this effort. The regulatory development will result in a document set that will include general requirements and rules for the Russian Navy MPC&A as well as specific instructions for operation and maintenance of each facility. The goals of the training program are to instill in managers a culture of sustainable commitment to MPC&A through the understanding of its principles and philosophies. In addition, the training program will help ensure that upgrades are effectively utilized and maintained by training operators and maintenance personnel in MPC&A principles as well in as the detailed operations of the systems.

Introduction

The Regulations and Training Projects are part of the U.S.-Russian Federation Materials Protection, Control, and Accounting (MPC&A) Cooperative Program to protect Russian Navy Fuels. The goal of the overall program is to upgrade the physical protection and item accountancy of the fuel assemblies from the time they are delivered to the Russian Navy until they enter into naval reactors. The program will upgrade the *land-based storage* of Russian Navy fresh fuels, the *floating platforms* that are used for fuel storage and reloading to Russian Navy reactors, and *inter-site land transportation*. Two land-based fresh fuels storage facilities have been chosen for immediate MPC&A upgrade: one at the Northern Fleet and one at the Pacific Fleet. Two floating platforms at the Northern Fleet and one floating platform at the Pacific Fleet will also have immediate MPC&A upgrading under this cooperative project. Specific instructions for operating and maintaining upgraded MPC&A systems will be prepared for each of the facilities.

Two portions of the multi-faceted program are regulation development and training. The regulations will cover all needs of the Russian Navy command as well as specific facilities. Training will help ensure effective, long-term operation and maintenance of MPC&A systems. The regulatory development will result in a document set that will include general requirements and rules for the Russian Navy MPC&A as well as specific instructions for operation and maintenance of each facility. The goal of the training program is to instill in managers a culture of sustainable commitment to MPC&A through the understanding of its principles and philosophies. In addition, the training program will help ensure that upgrades are effectively utilized and maintained by training operators and maintenance personnel.

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Background

The Russian Navy (MPC&A) upgrading project started in March 1995 with a request from the commander-in-chief of the Russian Navy to the Kurchatov Institute Russian Research Center (KI RRC) to cooperate on MPC&A upgrades for Russian Navy nuclear fuels storage and handling. Possible U.S. cooperation in this work was also suggested. After several communications and meetings on the working level, the U.S. Secretary of Energy, the Russian Navy representative, and the President of KI RRC issued a joint statement on the subject in July 1996. This statement announced that "the Russian Ministry of Defense and United States Department of Energy decided to jointly cooperate to ensure the highest possible standards of control, accounting, and physical protection for all storage locations of the Navy of the Russian Federation, containing fresh highly enriched uranium fuels for naval nuclear reactors." This effort would be conducted through the MPC&A program. The Russian Navy MPC&A program was formally initiated in response to this joint statement.

Regulatory Documentation

The first task of the documentation project was to assess the current MPC&A regulatory status for Russian Navy nuclear materials and to determine what regulations and guidelines were required. The regulations will apply to facilities, operations, and transportation of fresh nuclear fuels in the custody of the Russian Navy. Because the MC&A and the physical protection (PP) systems will have different functions and will be operated and maintained by different personnel, separate regulations will be prepared for MC&A and PP. The discussion here focuses on the MC&A regulations, but a similar process will be applied to the PP documents. To begin, a needs assessment was conducted and a plan developed. The plan takes into account the regulatory development program underway by Gosatomnadzor (GAN) and Minatom. GAN and Minatom are developing regulatory documents for use in the civilian and defense nuclear power complex. Though most of the provisions in these documents may be applicable to Russian Navy conditions, regulatory documents for the Navy may have unique requirements not covered by these documents. These specific requirements will be identified, evaluated, and included in the Russian Navy MPC&A regulatory documents.

Documentation Levels

There is a four-level hierarchy of Russian regulating documents: 1) federal level, 2) Navy level, 3) operational level, and 4) site-specific level. Before writing operational and site-specific instructions, the higher Navy-level documents that provide general requirements and rules need be developed, cleared, and approved by Russian Navy command. In turn, these regulations must conform to all relevant Russian Navy requirements of federal-level regulatory documents.

Federal Level: Several existing federal-level legislative and accounting documents are being considered in developing the Russian Navy MC&A regulatory document. These include:

- Federal law on utilization of atomic energy (although activities related to the Russian Navy nuclear fleet are not formally covered by this law, many of its specific provisions are applicable to Russian Navy conditions.)
- Russian Federation Presidential Decree No.1923 dated 9/15/1994, *On Urgent Measures for Upgrading Nuclear Materials Accounting and Control System.*

- Russian Federation Government Order No. 34 dated 1/13/1995, *On Urgent Works for Development and Implementation of the State System of Nuclear Material Accounting and Control for the Year 1995*.
- Russian Federation Government Order No. 1205 dated 10/14/1996, *Concept for the State System of Accounting and Control of Nuclear Materials*.

The following other federal-level MC&A documents are being prepared or are in draft form:

- *Concept of the State System for Accounting and Control of Nuclear Material (SSAC)*,
- *Main Provisions of the SSAC*,
- *Requirements of the SSAC*,
- *Main Rules of Nuclear MC&A*,
- *Requirements for MC&A Equipment Certification*,
- *Terminology Glossary on MC&A*,
- *Requirements for Information Protection in MC&A*,
- *Requirements for Personnel Qualifications for MC&A*, and
- *Requirements for Inspector Qualifications*.

Navy Level: With the federal level documents serving as a reference point, development of Navy-level MC&A regulations was the first task in the regulatory project. Initially, Kurchatov Institute Russian Research Center staff members and Russian Navy officials agreed on the outline of the regulations that contained the following:

- purpose and objectives of nuclear MC&A in the Russian Navy,
- sphere of application and responsibilities for the regulations implementation,
- main requirement of MC&A organization at the Russian Navy command level,
- main requirement of MC&A organization at the operating organization and/or facility level, (e.g., facility MC&A personnel and their responsibilities, physical inventory taking, accounting other reports),
- access control to nuclear materials and containment and surveillance measures,
- Navy command supervision for MC&A, and
- main definitions and terms.

Using this outline, KI RRC prepared a draft regulation entitled *Temporary Regulatory Rules for MC&A*. Following several interactions and discussion with Russian Navy representatives, it was submitted to Russian Navy officials for their further consideration, comments, and changes. Russian Navy personnel finalized the draft, received necessary clearances, had it approved by the Russian Navy command, and issued it as *Temporary Regulations on MC&A in the Russian Navy*. Issuing this document allowed work to start on lower-level regulatory documents, namely, *Model Instruction for Land-Based Storage* and *Model Instruction for Floating Platforms*. This document will be modified based upon the contents of higher level documents yet to be developed.

The additional MC&A regulatory documents necessary for the Russian Navy are shown in **Figure 1**.

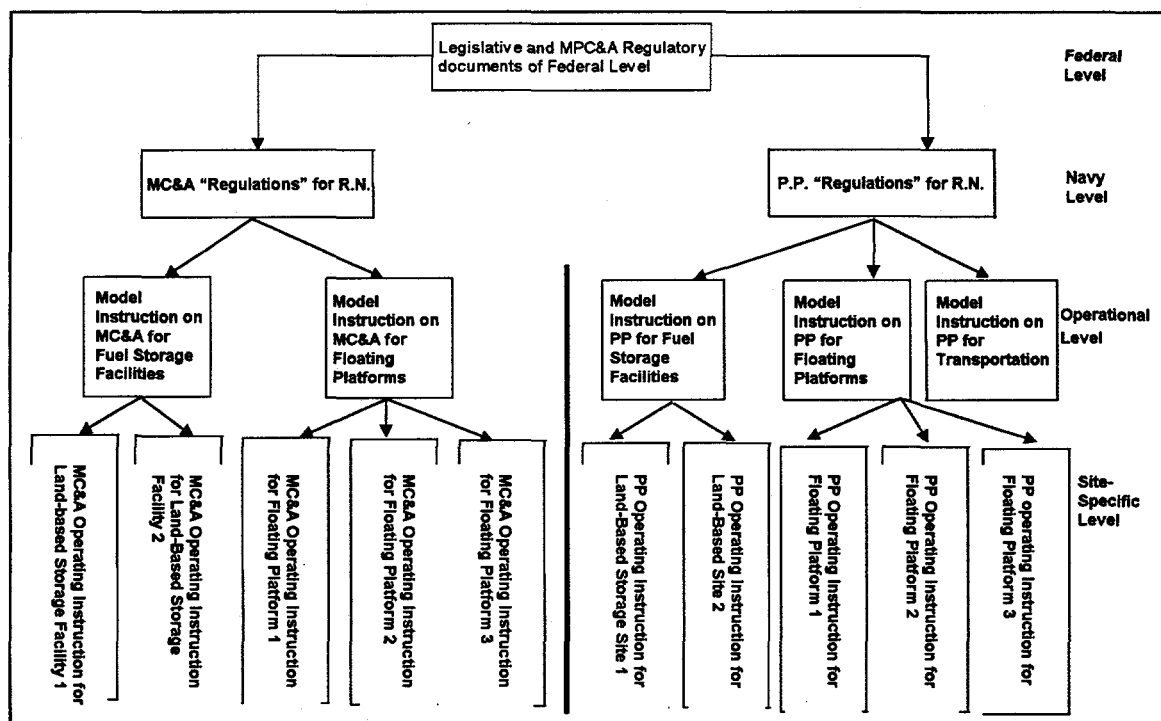


Figure 1. MPC&A Regulatory Documents for Russian Navy

The set of MC&A regulatory documents to be developed for the Russian Navy include:

- regulations (*Temporary Regulatory Rules for MC&A*)
- model instructions on MC&A in Russian Navy nuclear fuel storage facilities,
- site-specific instructions on MC&A at land-based sites,
- model instructions on MC&A at the floating platforms
- site-specific instructions on MC&A at the floating platforms,
- regulations and instructions for MC&A inspections at nuclear facilities of the Russian Navy,
- requirements and programs for the Russian Navy personnel training in MC&A.

A similar process will be followed for the preparation of the physical protection regulations for the Russian Navy. In addition, model instructions for physical protection during transportation will be prepared.

Operational Level: Model instructions for each type of operation—land-based storage, floating platforms, and transportation—will be developed. They provide general guidance for applying rules and procedures consistent with federal- and Navy-level requirements. The model instructions for fresh fuels storage facilities are being developed first, as they will be needed for operation of the MC&A system at the initial upgraded site.

Site-Specific Level: Site-specific MC&A and PP operation and maintenance instructions are required for each site where fresh Russian Navy fuels are stored. These instructions may be formulated on the basis of the model instruction using almost the same text for each, changing only the names of the responsible staff, identifying particular design features of material balance areas and key measurement points, and other relevant features specific for a given facility. The facility commander may approve facility instructions.

Training

The goal of the training project is to identify and implement appropriate MPC&A training activities for personnel at Russian Navy facilities and commands to ensure the existence of an effective, enduring MPC&A program. Training is directed toward personnel within these facilities and commands who have MPC&A responsibilities or who develop and deliver MPC&A training. The needs assessment and course preparation will result in an organized, managed, and coordinated to avoid duplication of effort and incorporate regulatory oversight. The curriculum will be designed so that completion of all sessions will provide sufficient knowledge for personnel to perform MPC&A functions. Management personnel and operational and support staff responsible for MPC&A activities will understand both the theoretical and the necessary operational aspects of the systems and equipment. Two MPC&A Fundamentals courses will be presented, one for Northern Fleet staff and a second for Pacific Fleet staff.

Performance Needs Assessment

The first phase of the training project is the development of a Performance Needs Assessment to identify priorities and objectives of required training to support the enhanced MPC&A systems.

The Performance Needs Assessment will address the following:

- knowledge, skills, and abilities necessary for employees to perform their jobs,
- use of relevant documents, such as activity reports, work studies, evaluations, and other data sources to obtain accurate and reliable information on both individual and organizational assessments,
- actions and milestones to establish MPC&A training, including resources, equipment, infrastructure, and personnel requirements,
- qualification criteria for instructors and instructor selection.

Kurchatov Institute Russian Research Center

Staff members from the Kurchatov Institute Russian Research Center are preparing to conduct the first training course for the Russian Navy in September 1998. This two-week course will take place in Moscow and will present MPC&A fundamentals and operational and maintenance practices for specific facilities. The course will include lectures, practical sessions, and demonstrations of operating MPC&A systems at the Kurchatov Institute. Three more training courses are planned over the next two years. The second course will be conducted in Moscow, and depending upon specific needs, subsequent courses will be conducted at fleet sites (**Figure 2**).

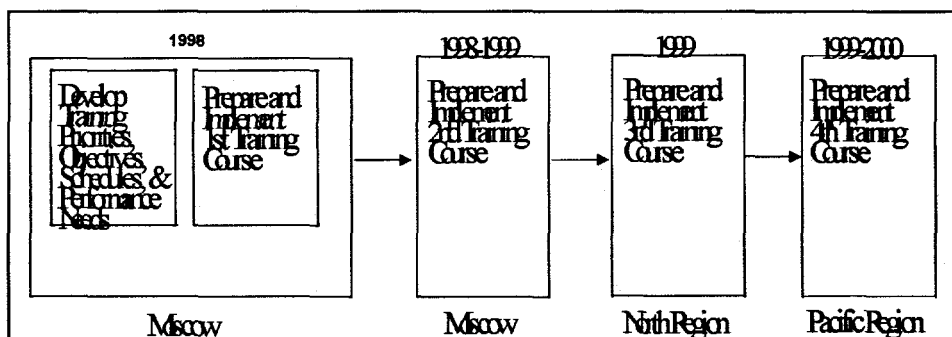


Figure 2. MPC&A Training for Russian Navy

Conclusion

The Russian Regulations and Training Projects are major components of the US-Russian Federation MPC&A cooperative program for Navy Fuels. The regulatory and training components are key to establishing and maintaining effective oversight, operation, inspection, and maintenance of Russia's nuclear fuels. The projects outlined here will provide timely requirements, procedures, and expertise to ensure that the upgraded security systems will provide adequate protection of Russia's critical materials now and in the future.