

**UPGRADING NUCLEAR MATERIAL PROTECTION, CONTROL AND ACCOUNTING
IN RUSSIA**

XA0200134

JACK CARAVELLI, CHRIS BEHAN

National Nuclear Security Administration, US Department of Energy, Washington, DC

LES FISHBONE

Brookhaven National Laboratories, Upton, NY, USA

I. PROGRAM GOAL AND ORGANIZATION

In this paper we review the Cooperative US-Russia Program of Nuclear Material Protection, Control and Accounting (MPC&A), whose goal is to reduce the risk of nuclear weapons proliferation by strengthening systems of MPC&A; thereby the Program enhances US national security. Based on this goal, the technical objective is to enhance, through US technical cooperation, the effectiveness of MPC&A systems at Russian sites with weapons-usable nuclear material, i.e. plutonium and highly enriched uranium. The Program exists because the extensive social, political and economic changes in Russia arising from the dissolution of the Soviet Union have increased the risk that these materials would be subject to theft or other misuse, with potentially grave consequences.

On the US side, the MPC&A Program is administered by the US Department of Energy (DOE) National Nuclear Security Administration through the DOE national laboratories and other contractors. On the Russian side, the Program is administered by the Russian Ministry of Atomic Energy (Minatom) through its nuclear sites, by the regulatory agency Gosatomnadzor, and by nuclear sites not under Minatom.

To carry out the Program objective, the DOE national laboratories consummate contracts with the Russian sites to implement agreed MPC&A upgrades. Deciding on what upgrades to perform depends on a cooperative analysis of site characteristics, materials, and vulnerabilities by joint US and Russian teams. Once the upgrades are agreed, the DOE laboratories supply technical and financial support and equipment to the Russian sites. The staff of the Russian sites do the work, and the US team members monitor the work through some combination--according to contract--of direct observation and reports, photographs and videotape supplied by the staff of the Russian sites.

II. MPC&A TASK AREAS

Information in this review covers a selection of topical areas, with a focus on implementation of the upgrades at the Russian nuclear sites, and on certain national or infrastructure areas:

- Regulatory Development
- Training
- Physical Inventory Taking and Material Balance
- Computerized Material Accounting and Control
- Bar Coding
- Nondestructive Assay Measurements
- Bulk (Weight and Volume) Measurements

- Tamper-Indicating Devices
- Nuclear Material Pedestrian Portal Monitors
- Access Control
- Building Hardening
- Federal Information System

III. RESULTS

To date, after more than six years of work, significant progress has been achieved in a variety of ways. For example:

Security improvements are underway on some 750 metric tons of highly enriched uranium and plutonium at many sites under the supervision of Minatom, Gosatomnadzor, the Russian Navy, and other Russian entities. Among these are an ingenious concrete-block delay system for plutonium storage at the Mayak Production Association and an inventory strategy at the Institute of Physics and Power Engineering that, by fostering the consolidation of items, reduces the time required to inventory them.

About 850 kg of HEU have been converted to low-enriched uranium in a project that is now active at two processing sites;

More than 1000 Russian MPC&A staff have undergone training at the Russian Methodological and Training Center; and

Hardening of more than 90 transport vehicles has enhanced transport security.

We will illustrate this progress in the paper by describing the MPC&A upgrade work at specific Russian sites.

IV. DISCUSSION

During its existence, the MPC&A Program has confronted several problems. They include issues surrounding taxation, exports, travel, assurances, and business practice. Most have been overcome, but sometimes only after long and sustained effort.

Positive results have been achieved because of the mutual desire of the United States and Russia to address the need for enhanced nuclear material protection, control and accounting at Russian nuclear sites. Yet while progress is significant at many sites, much work remains to be done at others. Achievements also accrue because others contribute to the overall effort. For example, the European community has played a key role with the US and Russia in supporting the Russian Methodological and Training Center in Obninsk. Further international cooperation will facilitate the overall goal.