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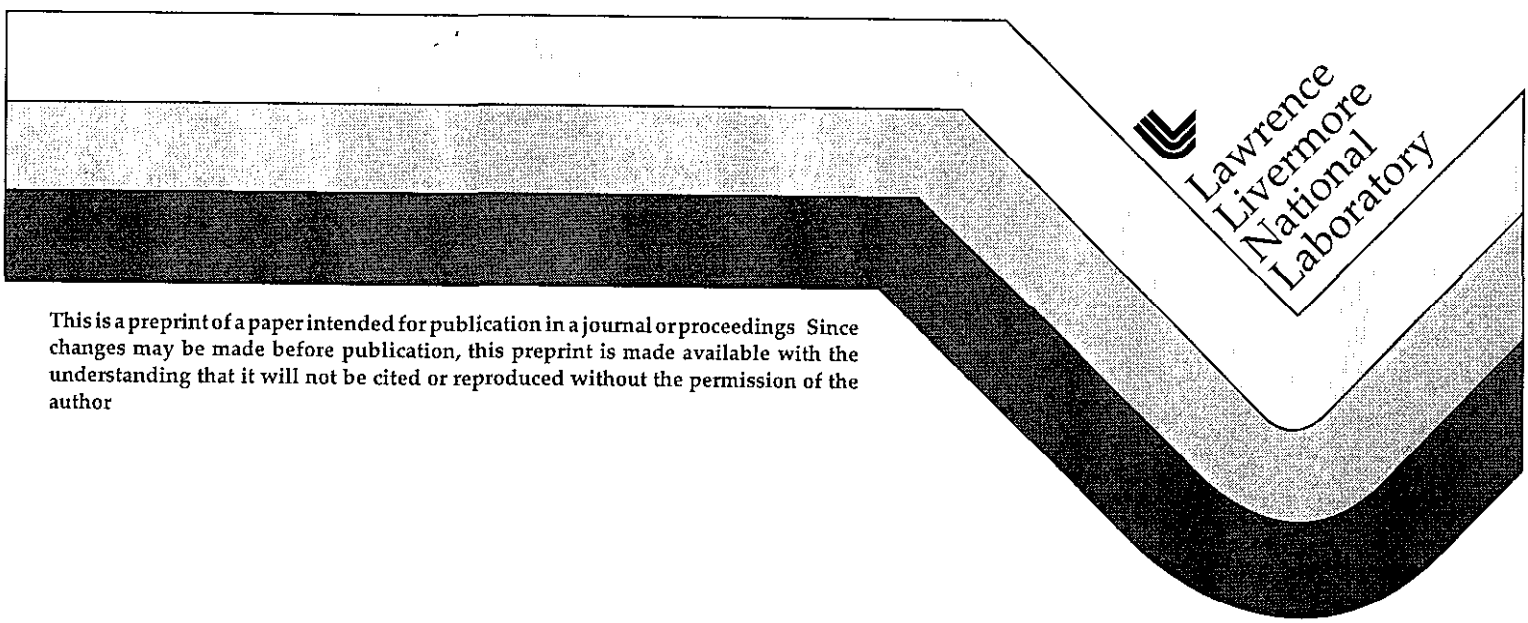

MATERIAL PROTECTION, CONTROL AND ACCOUNTING COOPERATION AT THE URALS ELECTROCHEMICAL INTEGRATED PLANT (UEIP), NOVOURALSK, RUSSIA[1]

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Abstract

The Urals Electrochemical Integrated Plant is one of the Russian Ministry of Atomic Energy's nuclear material production sites participating in the US Department of Energy's Material Protection, Control and Accounting (MPC&A) Program. The Urals Electrochemical Integrated Plant is Russia's largest uranium enrichment facility and blends tons of high-enriched uranium into low enriched uranium each year as part of the US high-enriched uranium purchase. The Electrochemical Integrated Plant and six participating national laboratories are cooperating to implement a series of enhancements to the nuclear material protection, control, and accountability systems at the site This paper outlines the overall objectives of the MPC&A program at Urals Electrochemical Integrated Plant and the work completed as of the date of the presentation

INTRODUCTION

The Ministry of Atomic Energy of the Russian Federation and the US Department of Energy are cooperating to enhance the physical protection and material accounting capabilities at Russian nuclear facilities. Through the US Department of Energy's Materials Protection, Control and Accounting (MPC&A) Program, US National Laboratory personnel are chartered to work with their peers at Russian nuclear facilities and identify areas where enhancements would reduce the threat of nuclear material theft The MPC&A program provides funding to allow the US project teams to provide equipment, training and funds for Russian labor for the site

The MPC&A cooperation with the Urals Electrochemical Integrated Plant began in June of 1996 The Urals Electrochemical Integrated Plant is located in the Urals Mountains north of Yekaterinburg in the closed city of Novouralsk and is Russia's largest uranium enrichment plant with a capacity of approximately ten million seperative work units per year. Formerly known as Sverdlovsk-44, Urals Electrochemical Integrated Plant produced high-enriched uranium for the Russian weapons program up until the late 80's Currently Urals Electrochemical Integrated Plant's principle activity is the production of commercial grade uranium hexafluoride (UF_6) for both domestic and foreign nuclear fuel fabricators Part of this production is the result of blending high-enriched uranium (HEU) into low-enriched uranium (LEU) as part of the US high-enriched uranium purchase In addition to their nuclear activities, Urals Electrochemical Integrated Plant is also involved in a number of successful non-nuclear commercial ventures.

The focus of the MPC&A program at Urals Electrochemical Integrated Plant is to enhance the accounting, control and protection of the high-enriched uranium blended at the site. The high-enriched uranium blending process at Urals Electrochemical Integrated Plant is shown in Figure 1 and spans the two technical areas that compose the production site, see Figure 2

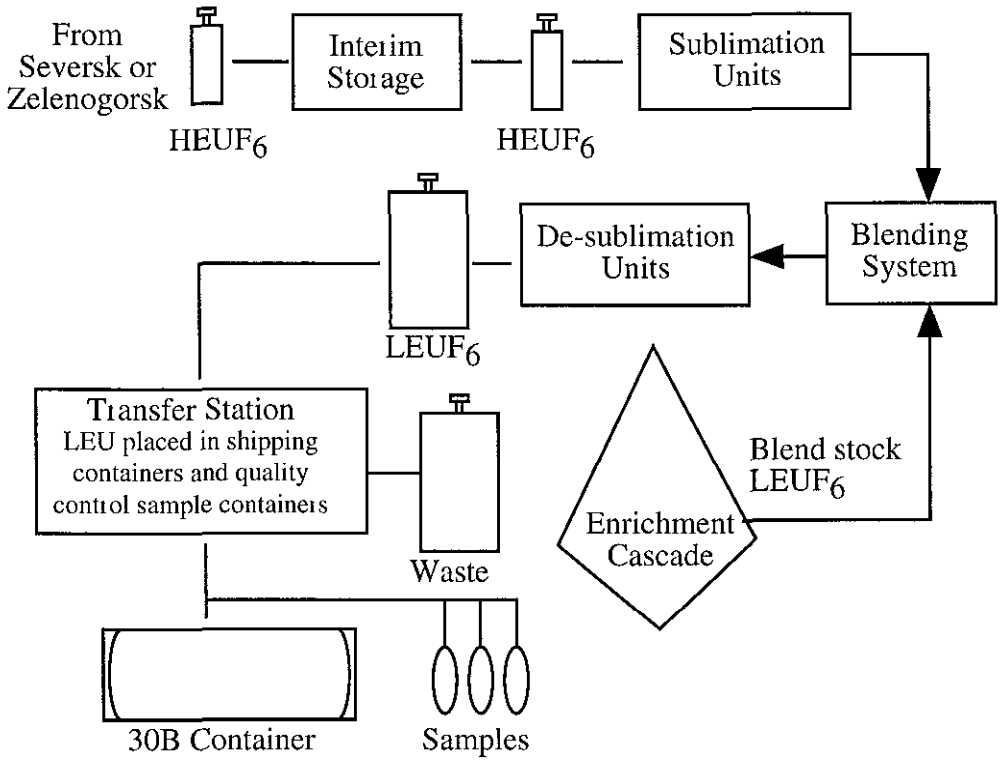

Figure 1: High-enriched uranium flow at the Urals Electrochemical Integrated Plant

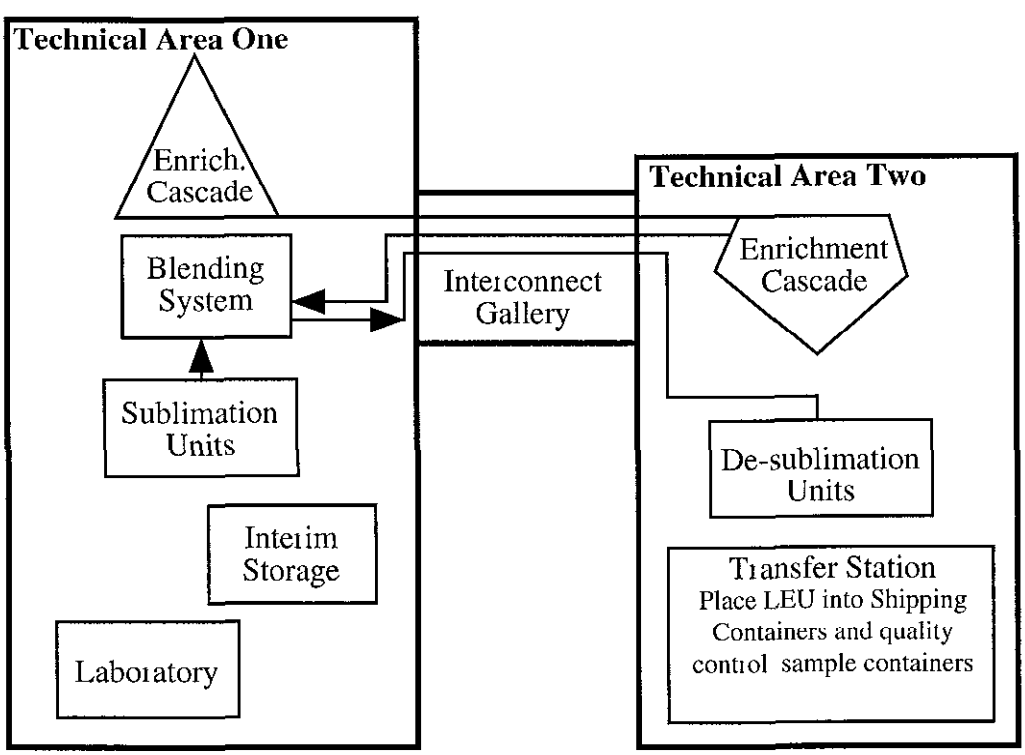

Figure 2: Blending functions by technical area

THE FY 98/99 SITE ENHANCEMENTS

Urals Electrochemical Integrated Plant and US experts have held discussions and toured the facility to identify areas where enhancements would reduce the risk of theft of nuclear material The first phase of the enhancements involve the personnel portals, vehicle portals, the interim storage facility and perimeter of Technical Area One, and various site-wide infrastructure enhancements to facilitate future MPC&A enhancements.

Physical Protection Enhancements

Video Surveillance and Assessment – Urals Electrochemical Integrated Plant and Alpha Priborare enhancing the video surveillance and assessment system for the site. The system provides increased coverage at the personnel portals, vehicle portals, critical areas around the perimeter, and inside the buildings storing or processing high-enriched uranium

Access Control – An upgraded access control system will be installed at Urals Electrochemical Integrated Plant and will be integrated into the alarm system, badging system and the video surveillance/assessment system Upgraded access control booths, utilizing badges and either personal access codes or biometrics, will be installed at the personnel portals, vehicle portals, and at entrances at key facilities

Radio Communications – An upgraded radio communications system for the security force has been specified and is being installed.

Security Network – A computer network for the security service is being installed to allow senior security managers and staff running the personnel and vehicle portals to be able to access the personnel/vehicle information system

Material Control and Accountability Enhancements

Material Control – Metal detection, x-ray package screening, and nuclear material detectors will be incorporated into the site access control systems at the personnel portals, vehicle portals, and key facility entrances

> Metal detectors – The personnel portals and entrance to the interim storage facility will have metal detecting portals and hand-held units
>
> X-ray package screening – X-ray screening devices to monitor packages entering and leaving the facility are being installed at each personnel portal and the entrance to the interim storage facility
>
> Nuclear material detectors – The access control system will incorporate personnel portals, over-under vehicle portals, and hand-held units to reconcile alarms.

Computerized Accounting – After reviewing the computerized accountability projects at other Russian Ministry of Atomic Energy's institutes and Kurchatov, Urals Electrochemical Integrated Plant has elected to develop the software for computerized accounting system on their own and without MPC&A funding. The MPC&A project team is providing the hardware infrastructure that will connect accountability workstations at the key measurement points to a central server. The computerized accounting system will provide data on the blending process and the transfer station

Bar Codes – Urals Electrochemical Integrated Plant will be implementing a bar code system for their in-process and sample containers. The bar code readers and printers will be tied to the accountability workstations.

Scales – The MPC&A program is providing Urals Electrochemical Integrated Plant with additional electronic scales that will be tied to the accountability workstations

Tags and Seals – Urals Electrochemical Integrated Plant is evaluating the seals available on the commercial market and will make a decision on whether to change their existing tag and seal program in the future.

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SUMMARY

The MPC&A program is cooperating with Urals Electrochemical Integrated Plant to enhance the nuclear material safeguards at the facility This cooperation has resulted in the definition of a series of physical protection and nuclear material control and accounting enhancements that will reduce the risk of theft of nuclear material from Urals Electrochemical Integrated Plant Implementation of these enhancements at Urals Electrochemical Integrated Plant is expected to continue through FY 2001.

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