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TITLE: TASK TEAM APPROACH TO SAFEGUARDS AND SECURITY DESIGNS

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TASK TEAM APPROACH TO SAFEGUARDS AND SECURITY DESIGNS

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ABSTRACT

In 1987, a U. S. Department of Energy (DOE) supported task team was organized at the request of the DOE Idaho Field Office (DOE-ID) to provide support for safeguards and security (S&S) designs of the Special Isotope Separation (SIS) facility. Prior to deferral of the project, the SIS facility was to be constructed at the Idaho National Engineering Laboratory (INEL) to produce weapons grade plutonium from DOE owned fuel grade plutonium. The task team was assembled to provide the resources necessary to assure that safeguards and security considerations were included as an integral part of the design of the facility, and that SIS designs would take advantage of available technology in the areas of physical security, measurements, accountability, and material and personnel tracking. The task team included personnel from DOE/Office of Safeguards and Security (DOE-OSS), DOE-ID, DOE contractors, and the national laboratories providing a wide range of expertise and experience. The team reviewed proposed designs and provided recommendations for safeguards and security features in each stage of the design process. The value of this approach to safeguards and security designs will be discussed with respect to benefits, lessons learned, and recommendations for future applications.

INTRODUCTION

This paper describes a team approach for providing the resources needed to design S&S systems for new nuclear facilities.

DOE Orders[1,2] require that heads of field organizations ensure that new facility designs include S&S systems necessary to meet compliance and performance standards. This responsibility is normally delegated to the S&S organization of the cognizant DOE office and/or operating contractor. Meeting this requirement for the design of major nuclear facilities is a significant demand on the resources of the affected safeguards and security organizations; however, timely input of S&S design features is crucial to ensure that DOE requirements are met, and to avoid the inefficiency and expense of retro-fitting required S&S systems.

THE SIS SAFEGUARDS AND SECURITY TASK TEAM

Prior to deferral of the project, DOE had planned construction of the SIS facility at the INEL. The SIS facility was designed to produce weapons-grade plutonium from fuel-grade material by a selective laser ionization process developed by LLNL. The facility was to be constructed on the site of the Idaho Chemical Processing Plant and operated by Westinghouse Idaho Nuclear Company (WINCO). Elements of the SIS process included receipt and storage of input material (plutonium oxide), chemical purification and oxide-to-metal conversion of input material, vacuum ionization separation of ^{239}Pu from other plutonium isotopes, aqueous ion exchange scrap recovery, and storage of product and byproduct materials.

To obtain the resources needed for the SIS design effort, DOE-ID requested DOE-OSS to organize and fund a group of S&S experts from the DOE community. As a consequence, a task team was formed with participants from LLNL, Los Alamos National

Laboratory, Brookhaven National Laboratory, Sandia National Laboratory, WINCO/S&S, Westinghouse SIS Project, DOE-OSS, DOE-ID/SIS Project Office, and DOE-ID/S&S. The team was formally headed by a DOE-OSS representative; however meetings were organized and chaired by LLNL/Westinghouse SIS Project personnel. The task team was active from the October 1987 until the final close out meeting in April 1990. A more detailed description of the SIS process and a summary of the results of the task team S&S design effort has been published previously.[3]

TASK TEAM ACCOMPLISHMENTS

During its tenure, the task team contributed to the development of design criteria in their areas of specialization. These contributions were important in the development of finalized Functional Design Criteria (FDC) for physical security and material control and accountability (MC&A).[4,5] The team also provided input to the FDC for an integrated plant information control system that included MC&A and physical security computer systems.

Significant issues addressed by the task team included accountability measurements for feed material high in americium and byproduct material with unusual isotopic composition, as well as for more commonly encountered materials; automated control/surveillance of material in transit and in storage to reduce inventory and handling requirements for high specific activity materials; safeguards information systems to maintain data on inventories and track material transfers; sensitivity analyses to model the propagation of variance calculation of LEID for various proposed accountability structures for the plant; development of a process monitoring system for SIS; control of access to materials through compartmentalization, personnel access controls, and personnel tracking systems; and control of personnel during emergency evacuations.

With the indefinite postponement of the SIS project, the task team was dissolved before initiation of development of the System Design Requirements (SDR) and System Design Description (SDD) documents.

CONCLUSIONS/LESSONS LEARNED

Problems encountered were primarily due to the initial failure to clearly designate the lead organization for the task team, and to the lack of coordination of the efforts of the S&S task team and the SIS Production and Development organization. The former resulted in a delay in the start of effective actions by the task team; the latter caused considerable confusion when changes in plant process or S&S designs were not effectively communicated.

Despite these difficulties, the consensus of those involved was that the task team approach can be a effective method of assembling and utilizing resources for a major design effort.

REFERENCES

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