



**U.S. Department of Energy
Technical Qualification Program**

***OAK RIDGE OPERATIONS OFFICE
DEFENSE NUCLEAR FACILITIES***

Study Guide

Introduction and Overview

**Developed by the
OAK RIDGE OPERATIONS OFFICE
TRAINING AND DEVELOPMENT DIVISION**

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INTRODUCTION

This study guide was developed to support participants in the Department of Energy's Technical Qualification Program (TQP). In the TQP, critical competencies are identified for DOE personnel to demonstrate proficiency in their work positions. The study guide presents information identified through various ORO office/facility-specific qualification standards and is geared towards addressing basically one competency. The target competency states "...personnel shall demonstrate a familiarity level knowledge of the basic operations and processes for DOE-ORO defense nuclear facilities." The terminal learning objective of the study guide matches this competency statement.

The competency is further broken down into the following supporting knowledge and skill statements (which match the enabling learning objectives of the study guide):

- Discuss the primary mission(s) of ORO defense nuclear facilities (e.g., Y-12, ORNL Building 3019, East Tennessee Technology Park, and Paducah and Portsmouth gaseous diffusion plants).
- Describe some of the key operations processes performed at ORO defense nuclear facilities.
- Discuss the major nuclear safety risks to workers and the public resulting from operations at ORO defense nuclear facilities.
- Identify the major non-nuclear hazards associated with ORO defense nuclear facility operations.
- Discuss the primary safety systems and features at ORO defense nuclear facilities for preventing or mitigating operational accidents.
- Discuss the ORO's defense nuclear facilities' major waste streams from generation to disposal. (Senior Technical Safety Managers only)

This competency (and supporting knowledge and skills) was included in the following DOE ORO qualification standards:

- Assistant Manager for Construction and Engineering
- Emergency Management Program Office
- Environmental Management
- Portsmouth Site Office
- Paducah Site Office
- Safeguards and Security
- Senior Technical Safety Managers
- Training and Development Division

Learning Objectives

Terminal Learning Objective

After reviewing this study guide, Oak Ridge Operations (ORO) TQP participants shall demonstrate a familiarity level knowledge of the basic operations and processes for DOE ORO defense nuclear facilities.

Enabling Learning Objectives

- 1.1 **LIST** the ORO defense nuclear facilities.
- 1.2 **IDENTIFY** the primary mission(s) of the ORO defense nuclear facilities.
- 1.3 **DESCRIBE** the key operations processes performed at ORO defense nuclear facilities.
- 1.4 **EXPLAIN** the major nuclear and non-nuclear safety risks to workers and the public resulting from operations at ORO defense nuclear facilities.
- 1.5 **STATE** the primary safety systems and features at ORO defense nuclear facilities for preventing or mitigating operational accidents.

Senior Technical Safety Managers only

- 1.6 **SUMMARIZE** ORO's major waste streams from generation to disposal.

OVERVIEW

Based in Oak Ridge, Tennessee, the Department of Energy's Oak Ridge Operations Office (ORO) is rich in history, dating back to World War II when the organization played a major role in the production of materials for the first atomic weapon. Since then, ORO has expanded far beyond that first mission and today supports more than 60 major Department of Energy (DOE) activities including major energy research and development programs, dismantling and storing nuclear weapons components, environmental management, managing the national Formerly Utilized Site Remedial Action Program (FUSRAP), managing the closeout activities for the Superconducting Super Collider Project, landlord responsibility for the United States Enrichment Corporation, and various educational programs. This study guide will focus on one important aspect of ORO, defense nuclear facilities.

By definition, defense nuclear facilities include production and utilization facilities, facilities involved in assembly, disassembly, testing of weapons, and nuclear waste storage facilities (DOE Order 140.1-1). ORO sites at which defense nuclear facilities are located include:

- Y-12 — Oak Ridge, Tennessee
- East Tennessee Technology Park — Oak Ridge, Tennessee
- Oak Ridge National Laboratory — Oak Ridge, Tennessee
- Paducah Gaseous Diffusion Plant — Paducah, Kentucky
- Portsmouth Gaseous Diffusion Plant — Portsmouth, Ohio