

U.S. DEPARTMENT OF ENERGY  
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

PRESENTATION TO  
THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

**SUBJECT: REACTOR - SPECIFIC DATA  
BASE DEVELOPMENT**

**PRESENTER: RICHARD C. WALLING**

**PRESENTER'S TITLE  
AND ORGANIZATION: MANAGER, RESOURCE MANAGEMENT PROGRAMS  
PACIFIC NORTHWEST LABORATORY  
RICHLAND, WASHINGTON**

**PRESENTER'S  
TELEPHONE NUMBER: (509) 376-5869**

**AUGUST 28-29, 1990**

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# **WHY IS THE REACTOR-SPECIFIC SPENT FUEL DATA BASE IMPORTANT?**

- **IT IS WASTE GENERATOR (REACTOR) ORIENTED**
- **IT CONTAINS INVENTORIES, PROJECTIONS, AND SITE INFORMATION**
- **IT IS UPDATED ANNUALLY FOR USERS**

# DATA COLLECTION

- **PRIMARY SOURCE: NUCLEAR FUEL DATA FORM RW-859**
  - **MANDATORY UTILITY SURVEY CONDUCTED BY THE ENERGY INFORMATION ADMINISTRATION (EIA)**
  - **REPORT BY EXCEPTION**
  - **SNAPSHOT IN TIME**
  
- **ALTERNATE SOURCES INCLUDE**
  - **DIRECT CONTACT WITH THE UTILITY (INFORMATION GAPS)**
  - **OTHER DATA COLLECTION**

# **RW-859 EVOLUTION**

- **PRE-RW-859**

- **EARLY SURVEYS WERE VOLUNTARY**
- **BATCH-LEVEL DETAIL ON FUEL**
- **NO CYCLE HISTORY; FINAL CYCLE AND BURNUP ONLY**

- **ORIGINAL RW-859 (CY-1984 TO CY-1986)**

- **ANNUAL UPDATE, END OF CY**
- **FULL DATA SET VERIFICATION BY UTILITY EACH YEAR**
- **ASSEMBLY-LEVEL DETAIL ON FUEL**
- **CUMULATIVE BURNUP REPORTED AT END OF EACH OPERATING CYCLE (NON-MANDATORY)**
- **FUTURE DISCHARGES PREDICTED TO END OF LIFE (EOL)**
- **AFTER 3 YEARS, HISTORY AND "STATIC" INFORMATION WELL ESTABLISHED**

# **RW-859 EVOLUTION**

(CONTINUED)

## ● **CURRENT RW-859**

- **ANNUAL UPDATE (2/3) OR FOLLOWING REFUELING (1/3)**
- **INFORMATION COLLECTED VIA RW-859 REDUCED TO THAT DATA WHICH IS SUBJECT TO CHANGE**
- **NEW DATA MERGED WITH PREVIOUS SUBMITTALS BY EIA**
- **BATCH-LEVEL COLLECTED ON FUEL; ASSEMBLY-LEVEL MAINTAINED BY EIA (CONTAINING SOME BATCH-AVERAGE DATA)**
- **BURNUP COLLECTED AT DISCHARGE POINT(S) ONLY**
- **FUTURE PROJECTED FOR 5 CYCLES**

# **DATA BASE CONTENTS**

- **REACTOR CHARACTERISTICS**
- **SPENT FUEL STORAGE**
- **SPENT FUEL CHARACTERISTICS**
- **OPERATING CHARACTERISTICS**

# DATA BASE CONTENTS

(CONTINUED)

- **REACTOR CHARACTERISTICS**
  - **NAME/ID**
  - **REACTOR TYPE/VENDOR**
  - **UTILITY**
  - **LOCATION**
  - **POWER RATINGS**
  - **START-UP-DATES (COMMERCIAL OPERATION, LOW POWER . . .)**
  - **SHUTDOWN DATES (RETIREMENT, LICENSE EXPIRATION)**
  - **FUEL HANDLING CAPABILITY**



# **DATA BASE CONTENTS**

(CONTINUED)

- **SPENT FUEL STORAGE**
  - **POOL CAPACITY (MAXIMUM, LICENSED, CURRENT)**
  - **POOL CONFIGURATION**
  - **DRY STORAGE CAPACITY**
  - **DRY STORAGE CONFIGURATION**
  - **ACCUMULATED INVENTORY BY CONTRIBUTOR**

# **DATA BASE CONTENTS**

(CONTINUED)

## ● **SPENT FUEL CHARACTERISTICS**

- **ASSEMBLY/BATCH IDENTIFICATION**
- **CYCLES IRRADIATED**
- **FUEL VENDOR/ASSEMBLY TYPE**
- **INITIAL ENRICHMENT**
- **INITIAL HEAVY METAL WEIGHT**
- **EXPOSURE (BURNUP)**

# **DATA BASE CONTENTS**

(CONTINUED)

- **SPECIAL SPENT FUEL  
CHARACTERISTICS**
  - **DEFECTS**
  - **MODIFICATIONS**
  - **MULTI-REACTOR IRRADIATION**
  - **OFFSITE LOCATION, DATE SHIPPED,  
MODE, CASK TYPE**

# **DATA BASE CONTENTS**

(CONTINUED)

- **OPERATING CHARACTERISTICS**

- **CYCLE ID**
- **CYCLE SHUTDOWN DATE**
- **EFFECTIVE FULL POWER DAYS (EFPD)**

# PROJECTIONS

- **REACTOR-SPECIFIC PROJECTIONS CONSISTENT WITH AGGREGATE PROJECTIONS**
- **UTILITIES PROVIDE FIVE CYCLE PROJECTIONS (5 to 10 YEARS)**
- **PROJECTED CAPACITY FACTORS BASED ON HISTORY**
- **NO NEW ORDERS WITH INCREASED BURNUP USED AS PLANNING BASE**
- **HIGH AND LOW ENERGY GROWTH AND BURNUP VARIATIONS USED FOR SENSITIVITY**
- **FORECASTING ASSUMPTIONS REVIEWED ANNUALLY**

# DISSEMINATION

- **REACTOR-SPECIFIC SPENT FUEL DATA BASE  
FOCUS ON END USER**
  - **CHARACTERISTICS DATA BASE**
  - **INTEGRATED DATA BASE**
  - **TOTAL SYSTEM LIFE CYCLE COST**
  - **NUCLEAR WASTE FUND FEE ADEQUACY**
  - **CONTRACT WASTE ACCEPTANCE PROCESS**
  - **SYSTEMS INTEGRATION**
  - **TRANSPORTATION**
  - **MONITORED RETRIEVABLE STORAGE**
  - **REPOSITORY**
  - **MATERIALS CHARACTERIZATION CENTER**