Developing DOE/RW Cask Transportation System Models

Chris Allen

N.C. State University

Objective for the Summer

- Assist in developing cask operations models. Review transportation specification documents for accuracy and content. These efforts will support DOE/RW in developing the transportation system for Yucca Mountain.

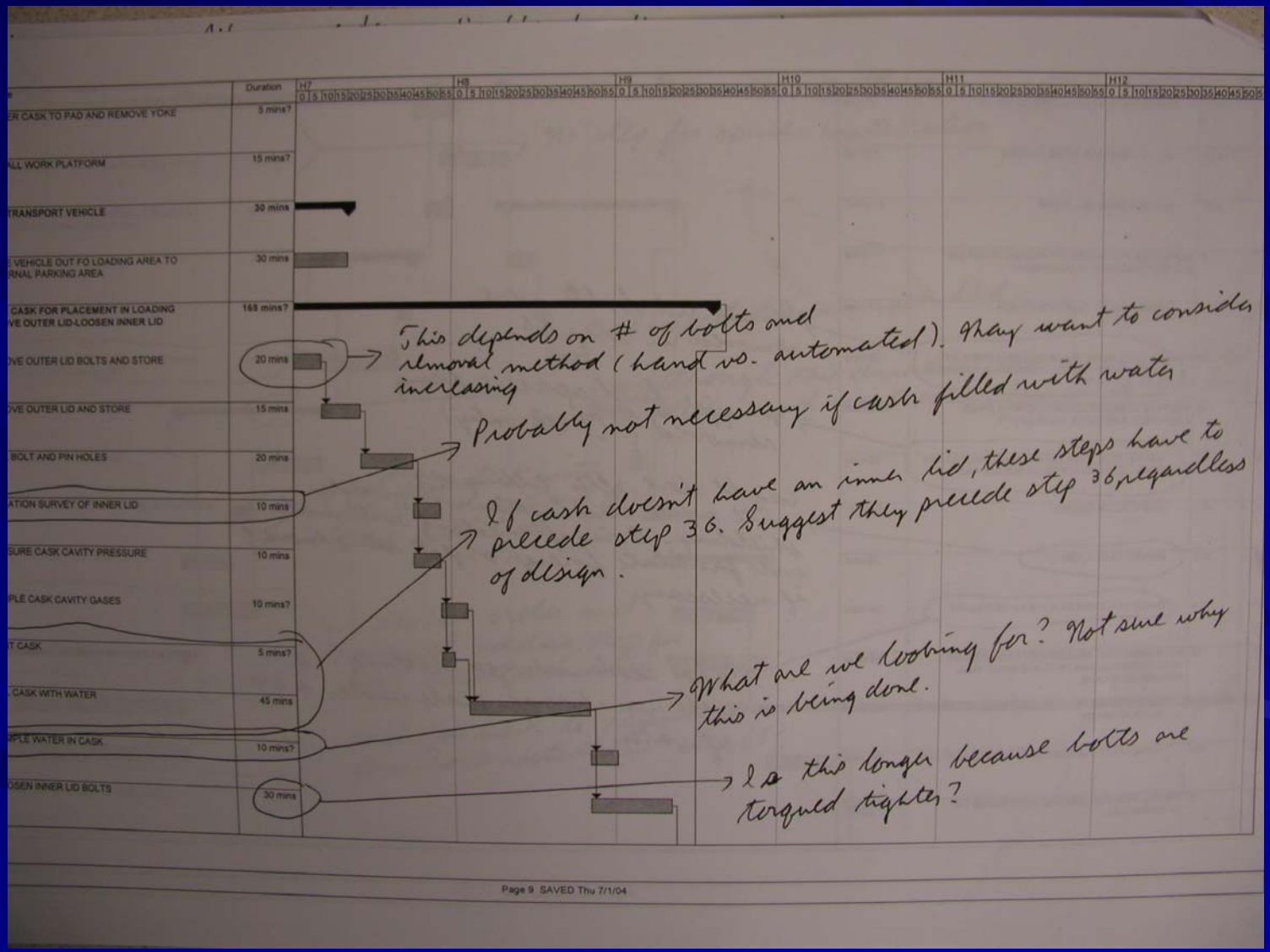
Insuring Safe and Efficient Transport of Spent Nuclear Fuel

- Model Cask Operations
  - Utilities
  - Fleet Management Facility (FMF)
- Route Selection
  - Best available truck and rail routes determined base upon population density, distance, etc.

At The Point of Origin

- Develop timeline for cask operations from arrival to departure
- Make the models applicable to as many reactor sites as possible

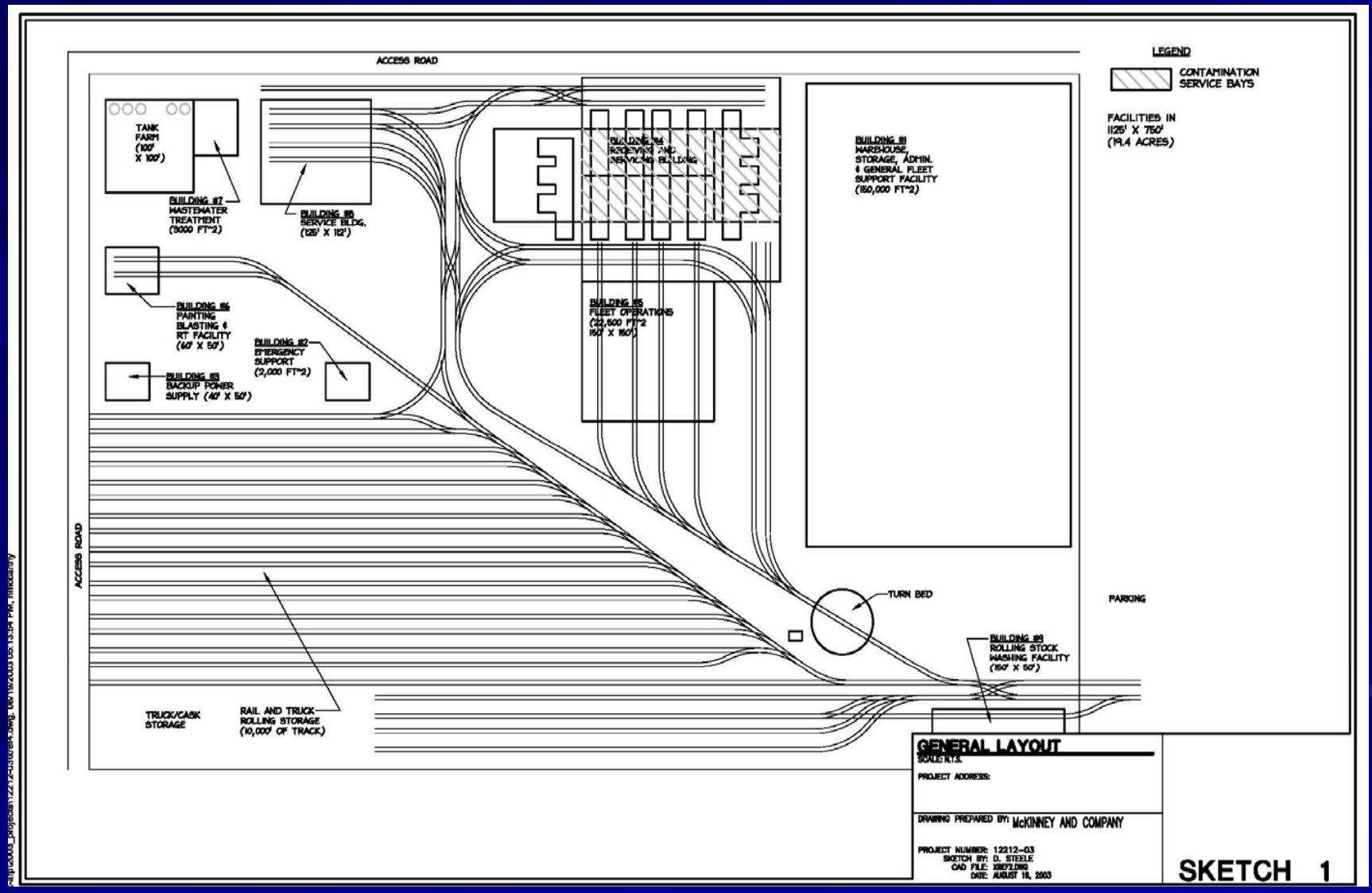
How Hard Can It Be?



The Other End of the Spectrum

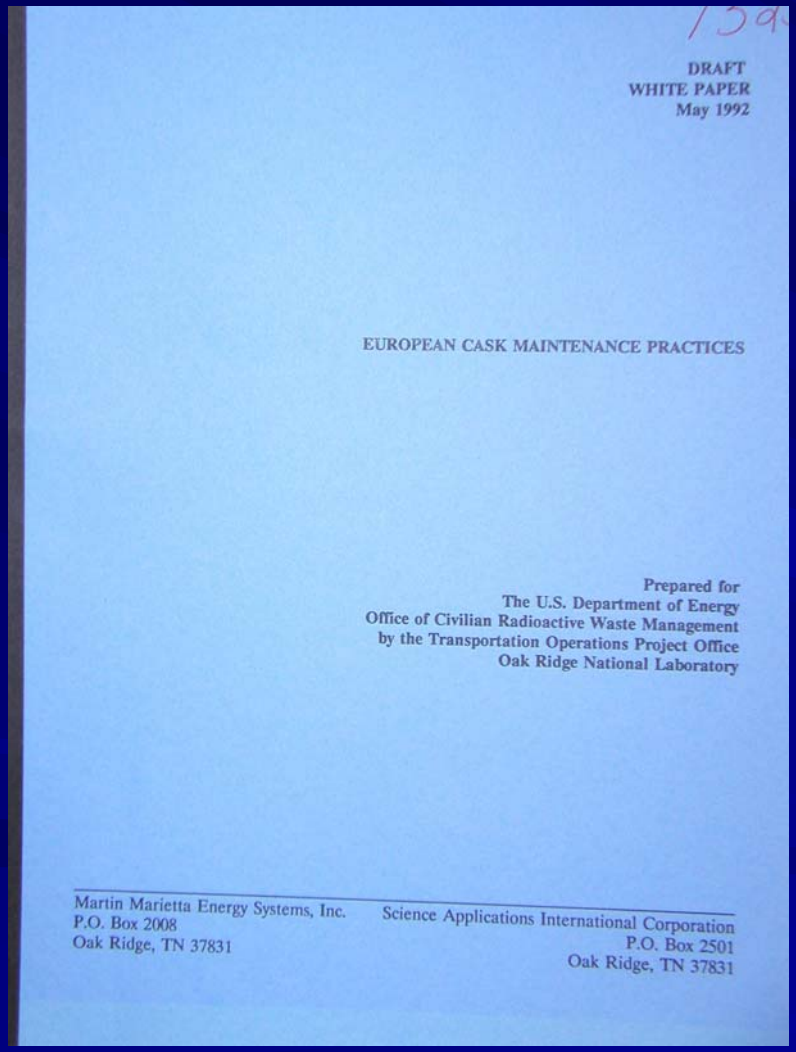
- Insure reliability and availability of DOE/RW shipping cask fleet through
  - Maintenance and minor repair of shipping cask fleet
  - Processing of both support equipment and shipping cask fleet
  - Storage of necessary equipment and spare parts

Conceptual Layout of FMF



Digging Through The Past

Same Work-Different Perspectives



DRAFT
WHITE PAPER
May 1992

EUROPEAN CASK MAINTENANCE PRACTICES

Prepared for
The U.S. Department of Energy
Office of Civilian Radioactive Waste Management
by the Transportation Operations Project Office
Oak Ridge National Laboratory

Martin Marietta Energy Systems, Inc.
P.O. Box 2008
Oak Ridge, TN 37831

Science Applications International Corporation
P.O. Box 2501
Oak Ridge, TN 37831

R Pope

TRANSPORTATION OPERATIONS PROJECT OFFICE

CONTRACTOR PEER REVIEW

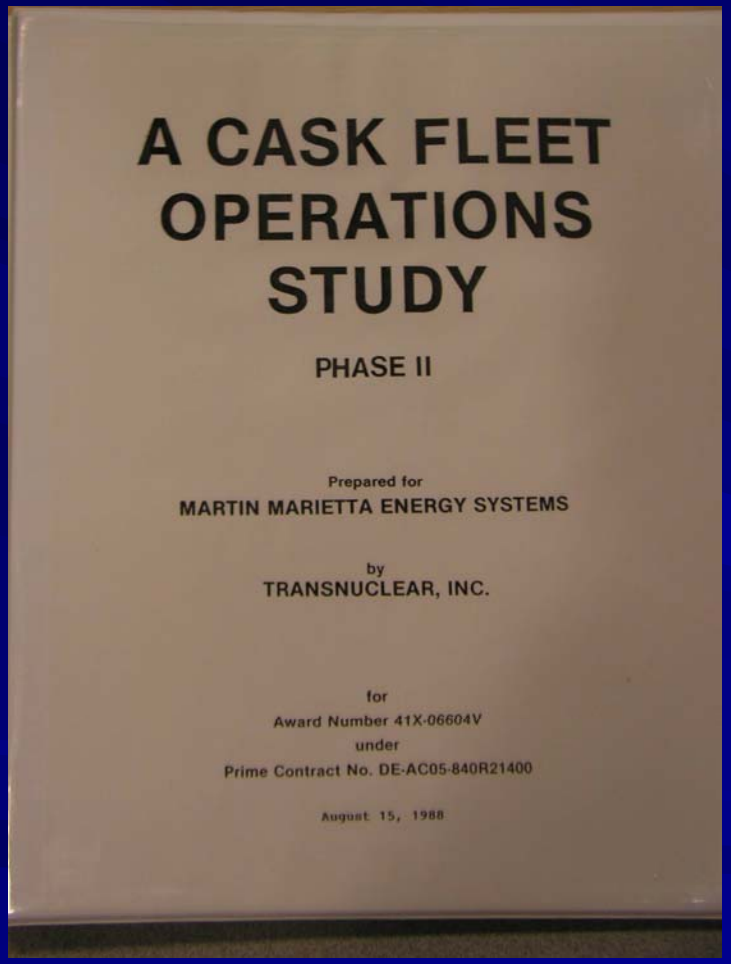
CASK MAINTENANCE FACILITY (CMF)
FEASIBILITY STUDY DESIGN CONCEPT

August 31 & September 1,

Oak Ridge, Tennessee

MARTIN MARIETTA

Cask Maintenance: Then and Now



A CASK FLEET OPERATIONS STUDY

PHASE II

Prepared for
MARTIN MARIETTA ENERGY SYSTEMS

by
TRANSNUCLEAR, INC.

for
Award Number 41X-06604V
under
Prime Contract No. DE-AC05-840R21400

August 15, 1988

NRC FORM 618 (8-2000) 10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9235	8	71-9235	USA/9235/B(U)F-85	1 OF	12

2. PREAMBLE

a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*
NAC International
3930 East Jones Bridge
Norcross, Georgia 30092

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
NAC International, Inc. application dated
March 1, 2004

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model No.: NAC-STC

(2) Description: For descriptive purposes, all dimensions are approximate nominal values. Actual dimensions with tolerances are as indicated on the Drawings.

A steel, lead and polymer (NS4FR) shielded shipping cask for (a) directly loaded irradiated PWR fuel assemblies, (b) intact, damaged and/or the fuel debris of Yankee Class or Connecticut Yankee irradiated PWR fuel assemblies in a canister, and (c) non-fissile, solid radioactive materials (referred to hereafter as Greater Than Class C (GTCC) as defined in 10 CFR Part 61) waste in a canister. The cask body is a right circular cylinder with an impact limiter at each end. The package has approximate dimensions as follows:

Cavity diameter	71 inches
Cavity length	165 inches
Cask body outer diameter	87 inches
Neutron shield outer diameter	99 inches
Lead shield thickness	3.7 inches
Neutron shield thickness	5.5 inches
Impact limiter diameter	124 inches
Package length:	
without impact limiters	193 inches
with impact limiters	257 inches

The maximum gross weight of the package is about 260,000 lbs.

The cask body is made of two concentric stainless steel shells. The inner shell is 1.5 inches thick and has an inside diameter of 71 inches. The outer shell is 2.65 inches thick and has

Identifying the Gaps

- Historical information compared to existing Performance Specification
- Comments and suggestions on facility design, facility equipment and facility operations created

Filling the Gaps

- Fissile material verification
- Identified the need for additional radiological areas
- Identified the need to clarify cask decontamination methods
- Identified the need to address cask “weeping”

Questions?