

SARENS GROUP

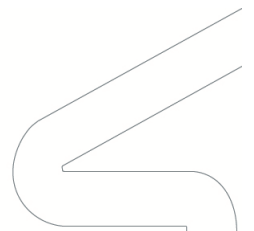
ITER



Hendrik Sarens
Gerrit Zenner



sarens
group



TODAY

80% FAMILY OWNED | 20% PRIVATE EQUITY



SARENS FAMILY BOARD MEMBERS



TODAY

60 COUNTRIES | MORE THAN 100 ENTITIES



TODAY'S SUBJECTS

SARENS HAS A NUCLEAR BUSINESS UNIT

- Component exchange for Life Extension of Gen 2
- New build of Gen 3 and Gen 3+
Modularization and Giant Cranes SGC120
- Decommissioning of Gen 1



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WORK HISTORY FROM 1980'S TO PRESENT

NUCLEAR POWER PLANT PROJECTS IN BELGIUM, FRANCE, HUNGARY,
SLOVENIA, FINLAND, SPAIN, BRAZIL, USA, JAPAN & SOUTH-KOREA

- 33 Steam Generator Replacement Projects (SGRP)
25 in USA, 4 in Japan, 4 in South-Korea
- 3 SGRP Awarded/In Process
1 in USA (Beaver Valley 2), 4 in South Korea (Pending)
6 in France (OLS & transport in Paluel, Flamanville and St Alban)
- 3 Core Internal Removal Projects
3 to 5 to go
- 5 Steam Generator Disposal Projects
1 to go
- 2 Decommissioning Projects
7 US projects with Sarens Managers
- 5 Dry Cask Storage Units
- 7 Reactor Vessel Heat Replacements Project
- 3 Ongoing Balance-of-Plant Work (power upgrades, etc.)
- 2 Stator Replacement project
1 awarded 6 pending



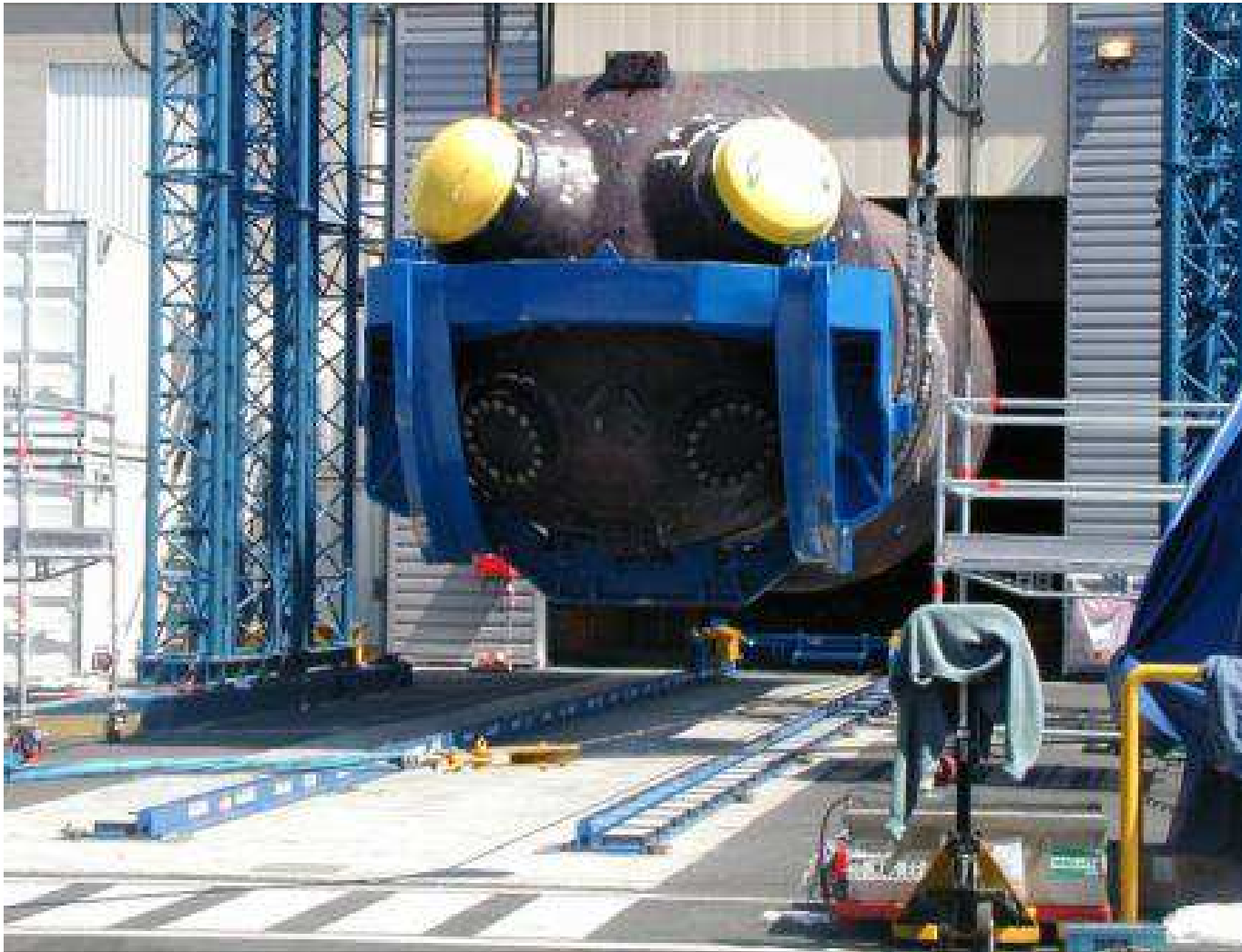
REACTOR PRESSURE VESSEL

HEAD REPLACEMENT INCLUSIVE CRDM



STEAM GENERATOR

LIFTING & SKIDDING

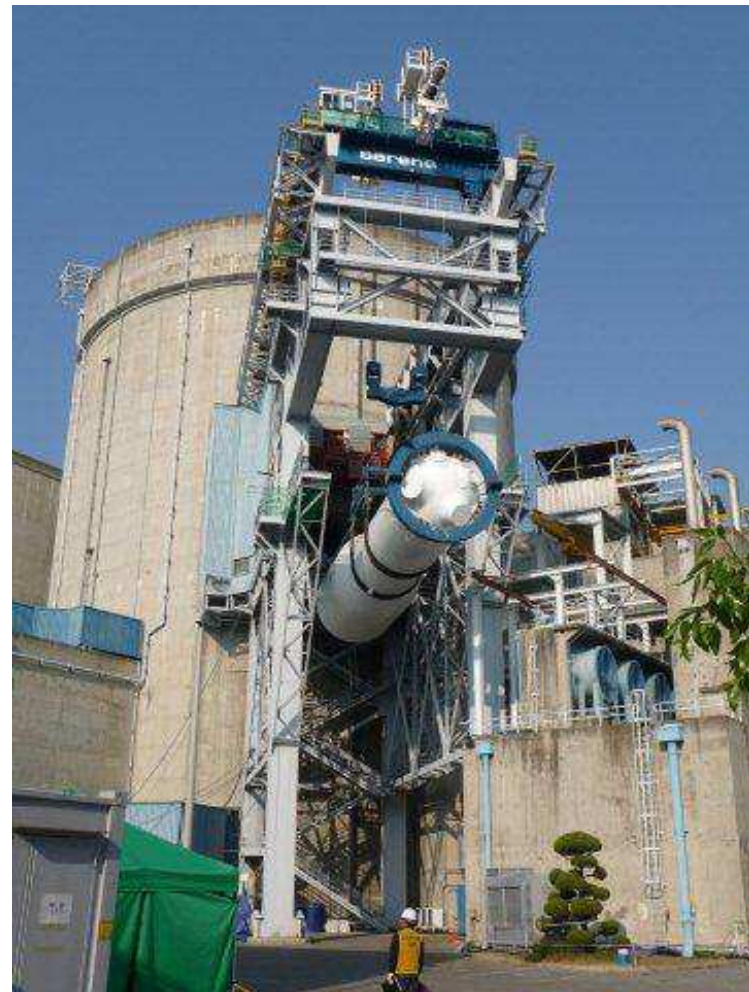


OUTSIDE LIFTING SYSTEM (OLS)

DEPENDENT ON USING EXISTING EQUIPMENT HATCH OR USING
CONSTRUCTION OPENING



OUTSIDE LIFTING SYSTEM (OLS - ULCHIN)

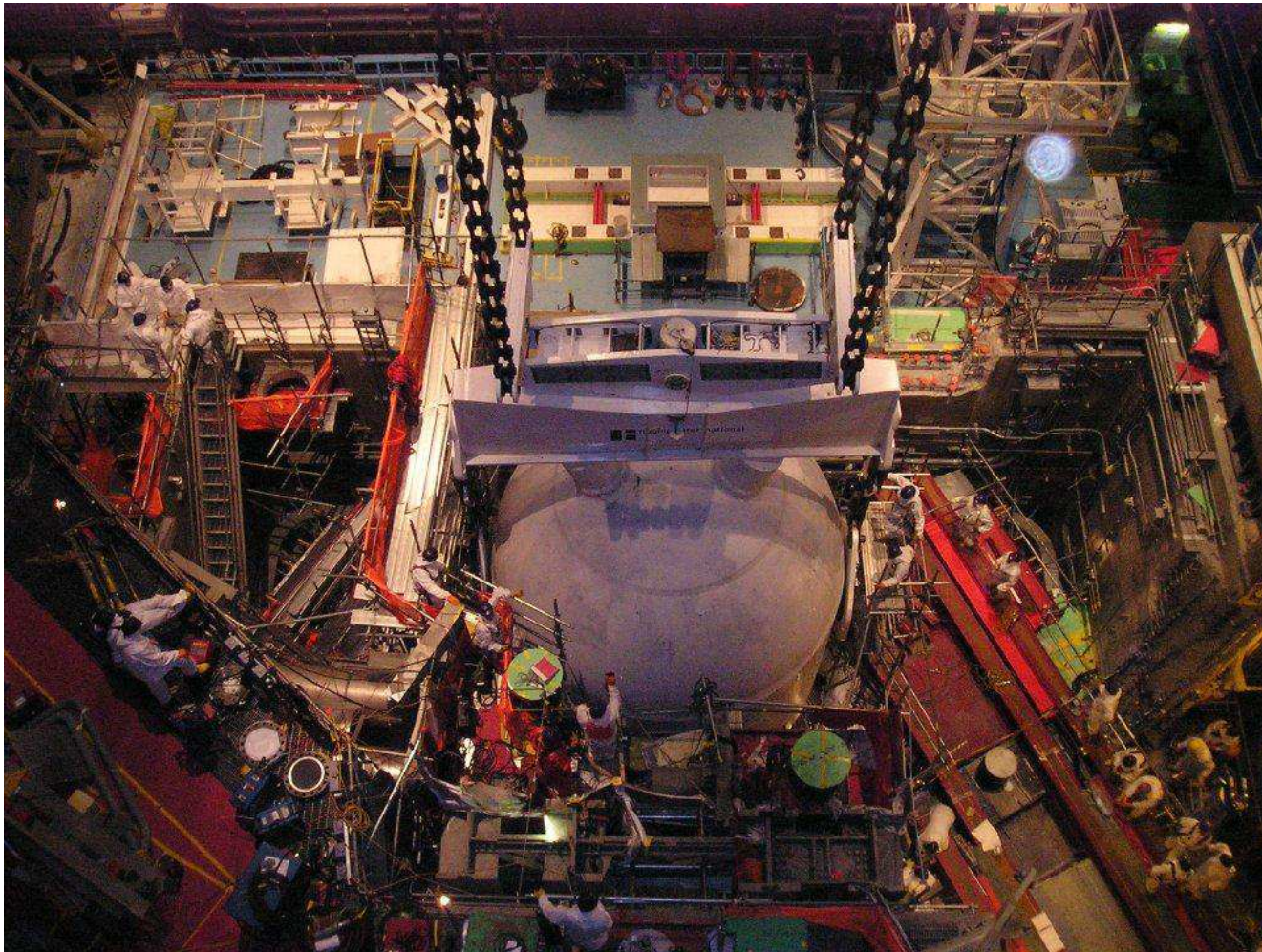


OUTSIDE LIFTING SYSTEM (OLS)

ARKANSAS OUTSIDE LIFTING SYSTEM



REMOVAL OF STEAM GENERATOR



SWIVEL IN SPREADER



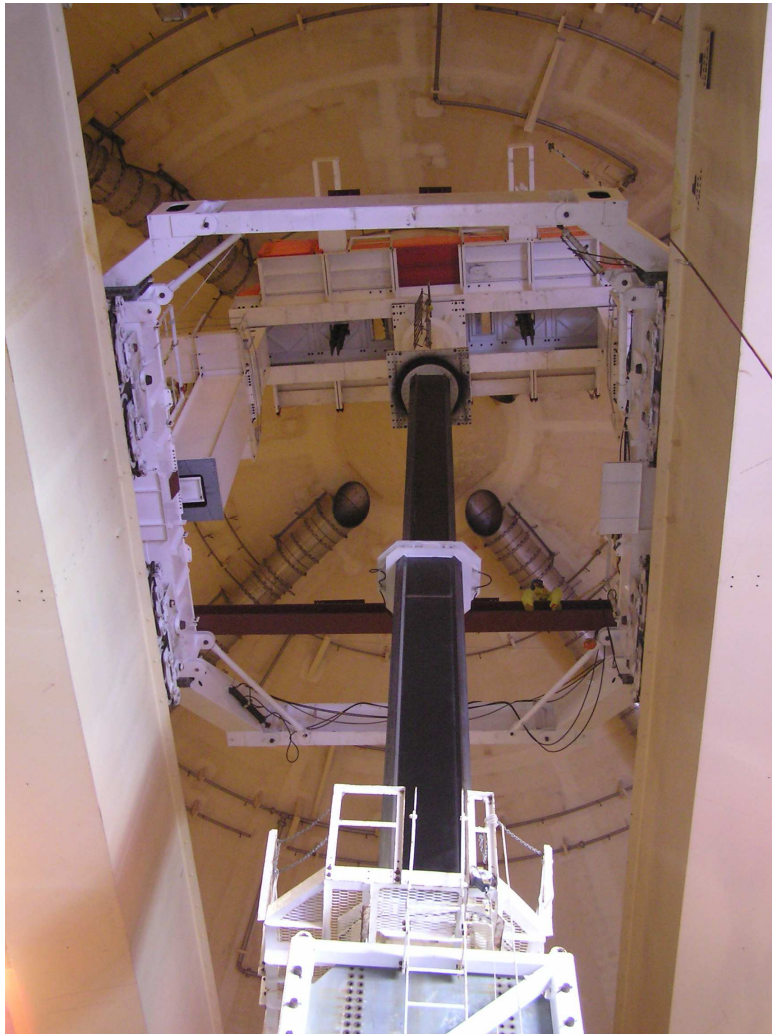
IN HOUSE DESIGNED

INNOVATIVE LIFT SOLUTIONS



INNOVATION IN RIGGING

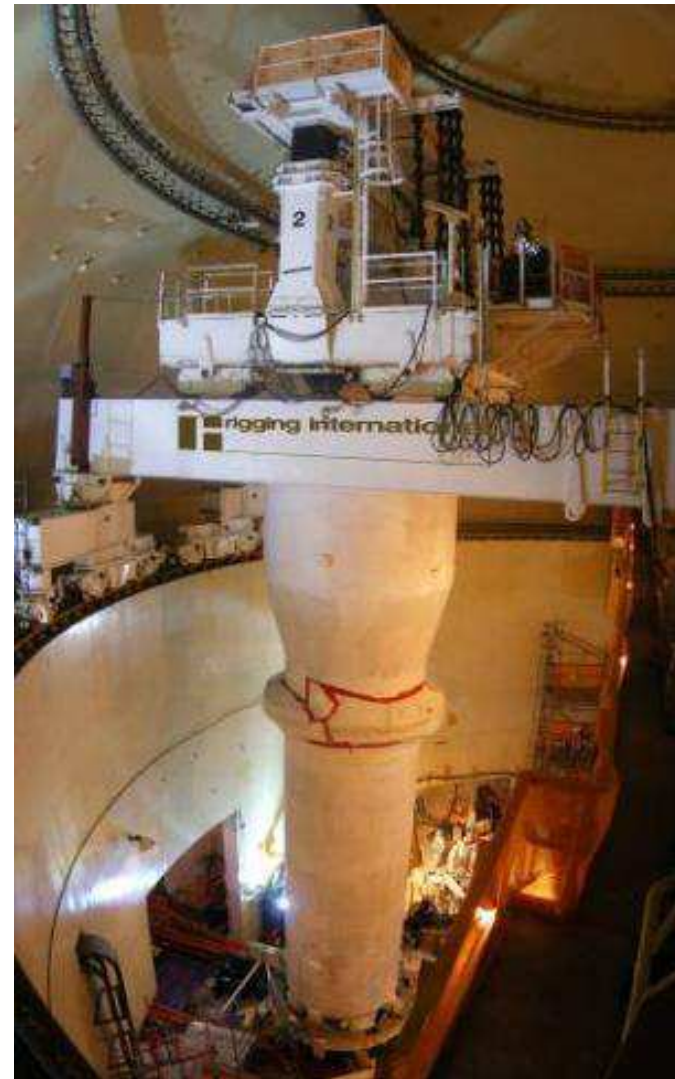
SONGS SGR PROJECT



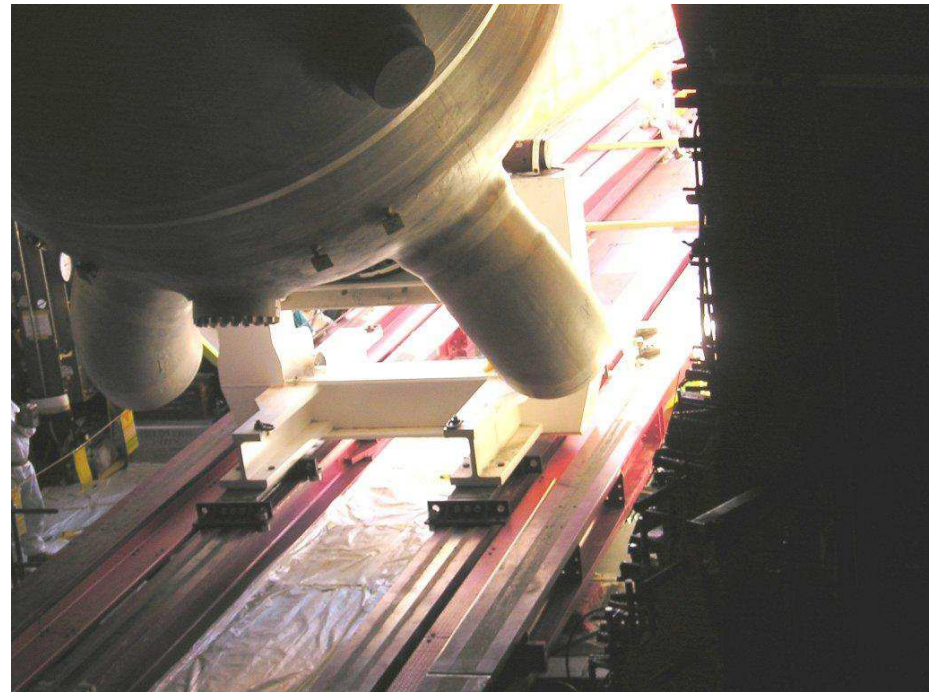
TEMPORARY LIFTING DEVICE (TLD)

BEAVER VALLEY, TEMPORARY LIFTING DEVICE

- Depending on:
 - containment crane capacity:
Polar Crane (PC) or
Gantry Crane
 - clear space above PC and lift
height required of equipment
to be handled
 - geometry and space
available inside containment



UP ENDING / DOWN ENDING EQUIPMENT



GENERATOR REPLACEMENT



GENERATOR REPLACEMENT AND



SGR OUTSIDE LIFTING GANTRY



REPLACEMENT STEAM GENERATOR OFFLOAD

CONFIGURATIONS AND APPLICATIONS

- o **Depending on:**

- Delivery method (Rail or Water)
- Site Layout
- Ground Bearing Conditions



Barge offload and steam generator transport. Arkansas Nuclear one



Cantilevered steam generator offloading system, Watts Bar



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NUCLEAR EXPERIENCE

● Olkiluoto 3 in Finland

- Lifting of the heavy components
- Lifting of the dome

● Flamanville 3 in France

- Transport of generator
- Construction of the power house
- Operating the gantry cranes on site
- Installation of Accumulators, MSR and other components
- Lifting of Heavy Components, Polar Crane & Dome with SGC-120



● Taishan 1 & 2 Installation of MSR

● Chernobyl

Installation of New Ventilation Stack in 2013

● Iter



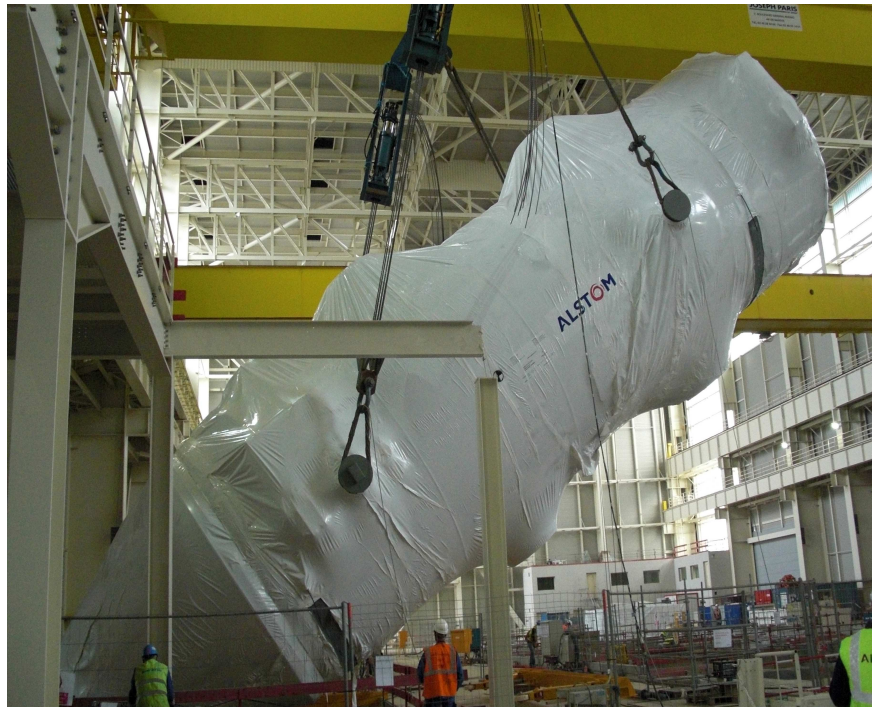
SPECIAL SPREADER

DEVELOPMENT



MSR

INSTALLATION FL3



LIFTING DOME IN OL3

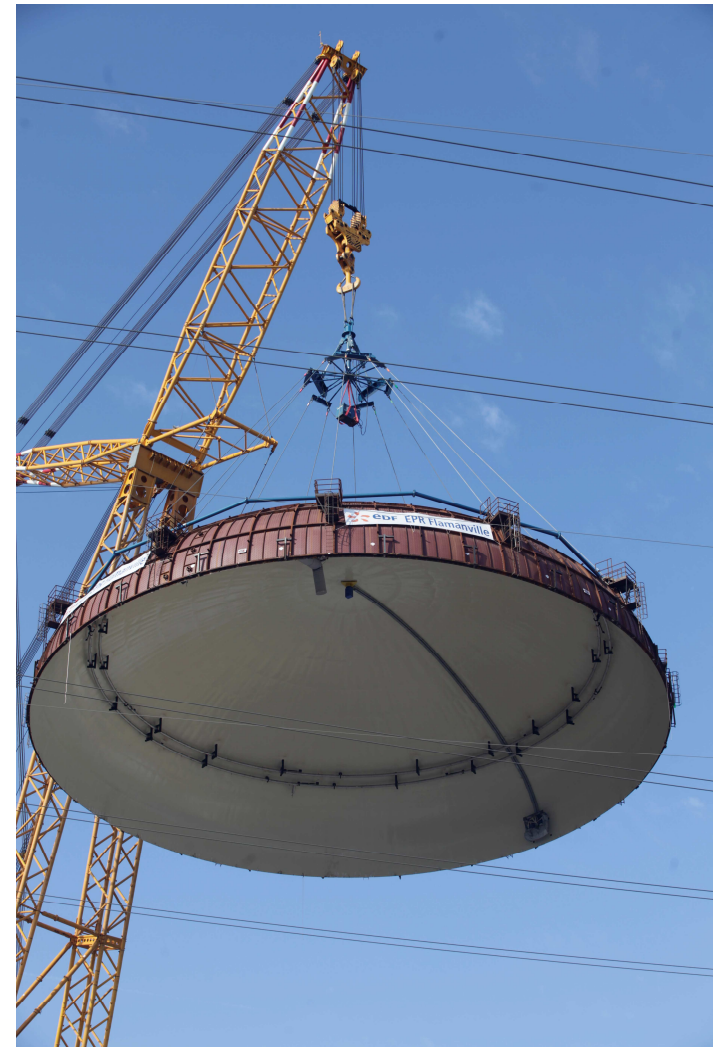


SGC-120

- Sarens Giant Crane
- Capacity 3200t @ 40m
- In-house built and engineered
- True crane with hook block and winches
- Full containerized mobilization



DETAILS SARSPIN



SGC-120



AP 1000 MODULE TRANSPORT ON VC SUMMER



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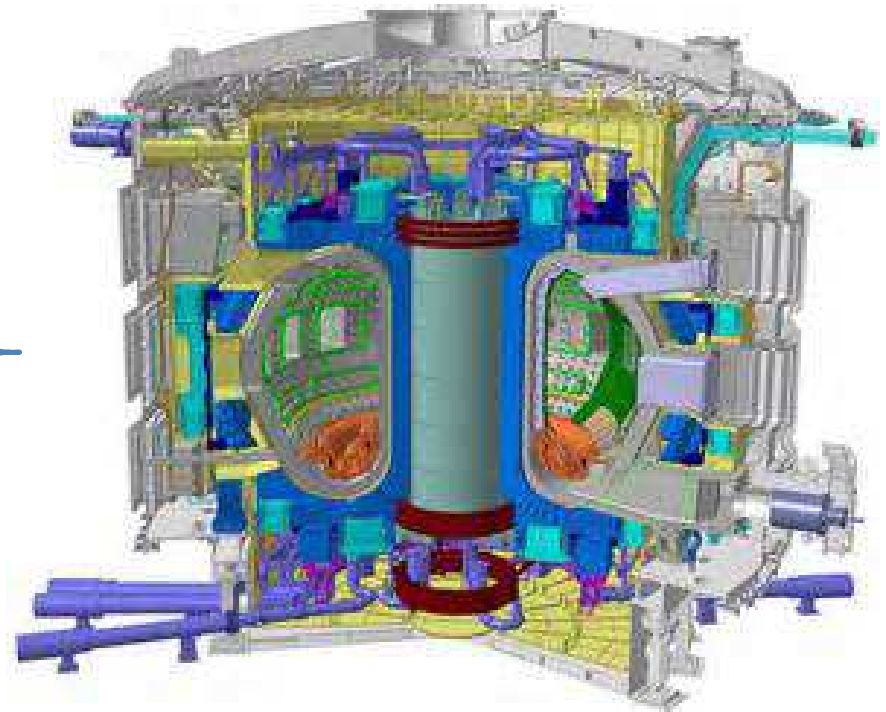


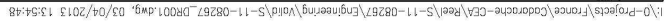
ITER

TRANSPORT & LIFTING

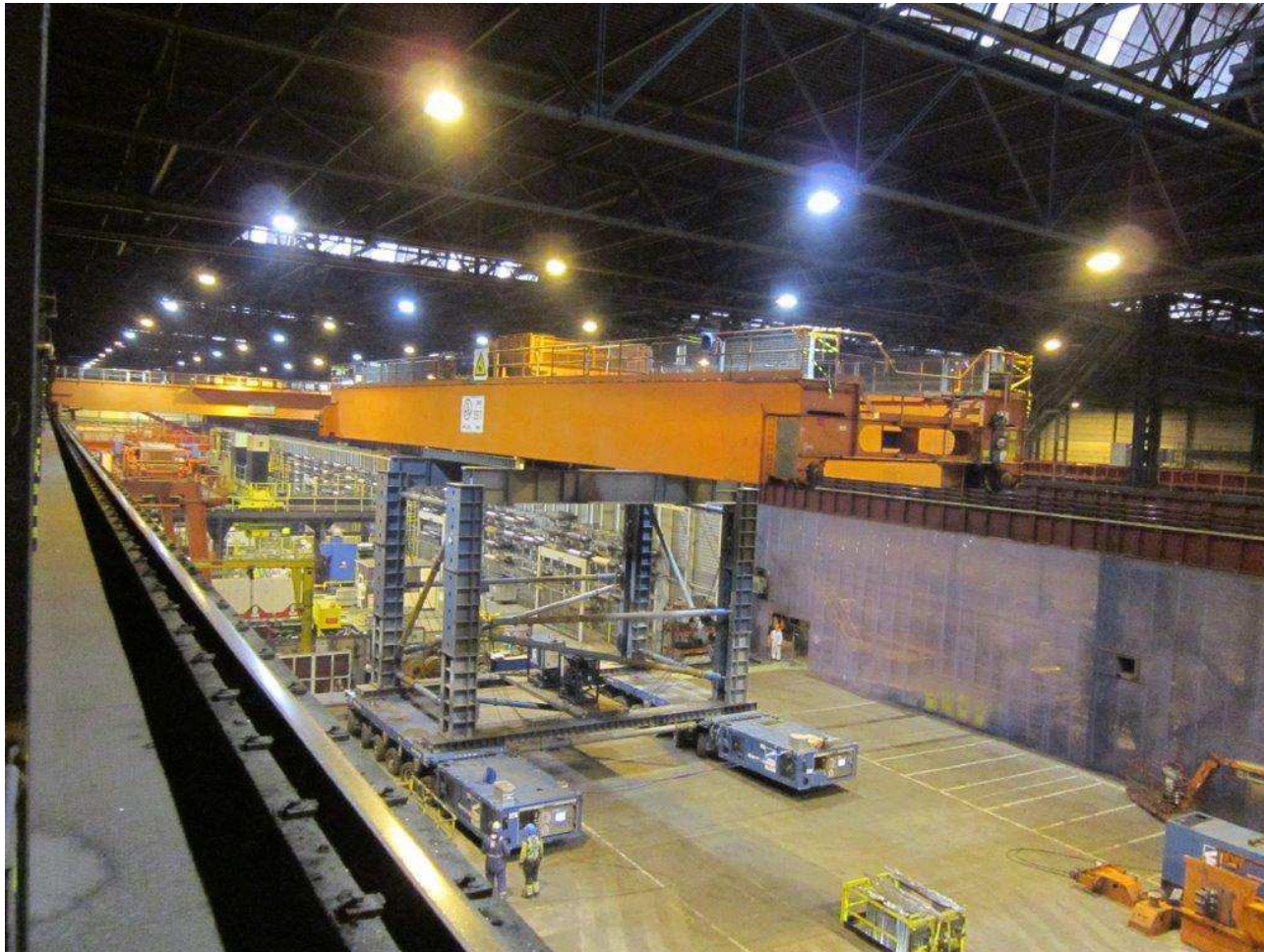
- 2 x 160t crawler for installation of steel construction
- Internal transport of cryostat elements
- Still tendering:

- installation of 2 heavy gantries 750t capacity each
- testing of the gantries separate and together 1.500t
- installation of 2 smaller gantries 50t capacity





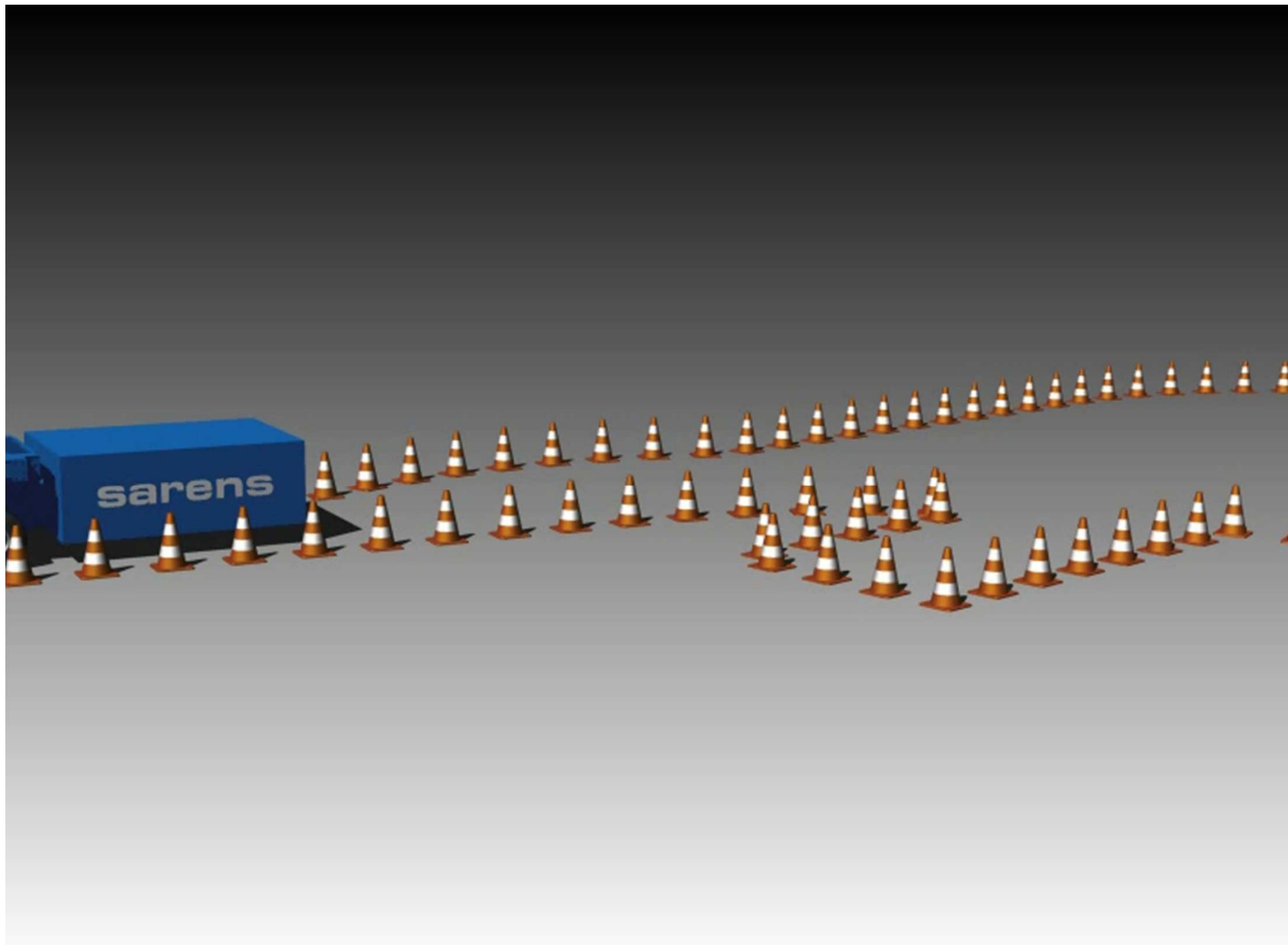
INSTALLATION OF GANTRY



PRE ASSEMBLY HEAVY GANTRY

FLAMANVILLE 3 : 300T CAPACITY







LOWER CYLINDER	
Lower Cylinder	417 T
Frame	90 T
Fixtures	100 T
Total Weight	607 T

AP 1000 MODULE TRANSPORT ON VC SUMMER



NUCLEAR

- Technical work preparation
- Optimized efficiency
- Minimum cost & time
- Creating economical solutions
- Providing support
- Flexible approach
- Reliable partner

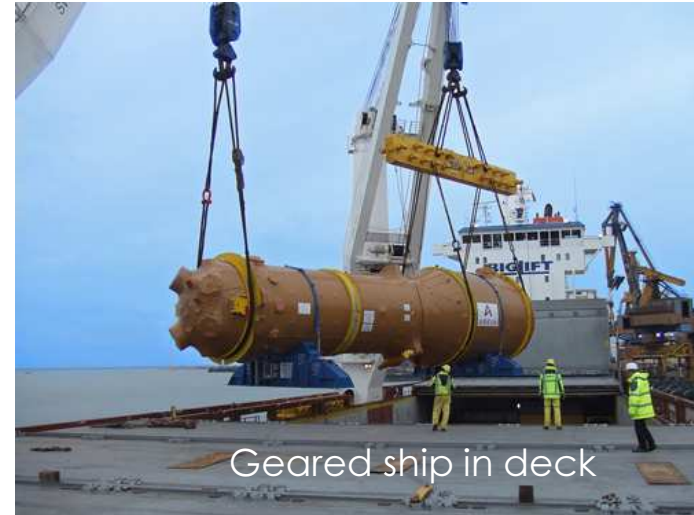


NUCLEAR

FROM FACTORY TO FOUNDATION



FROM FACTORY TO FOUNDATION



FROM FACTORY TO FOUNDATION



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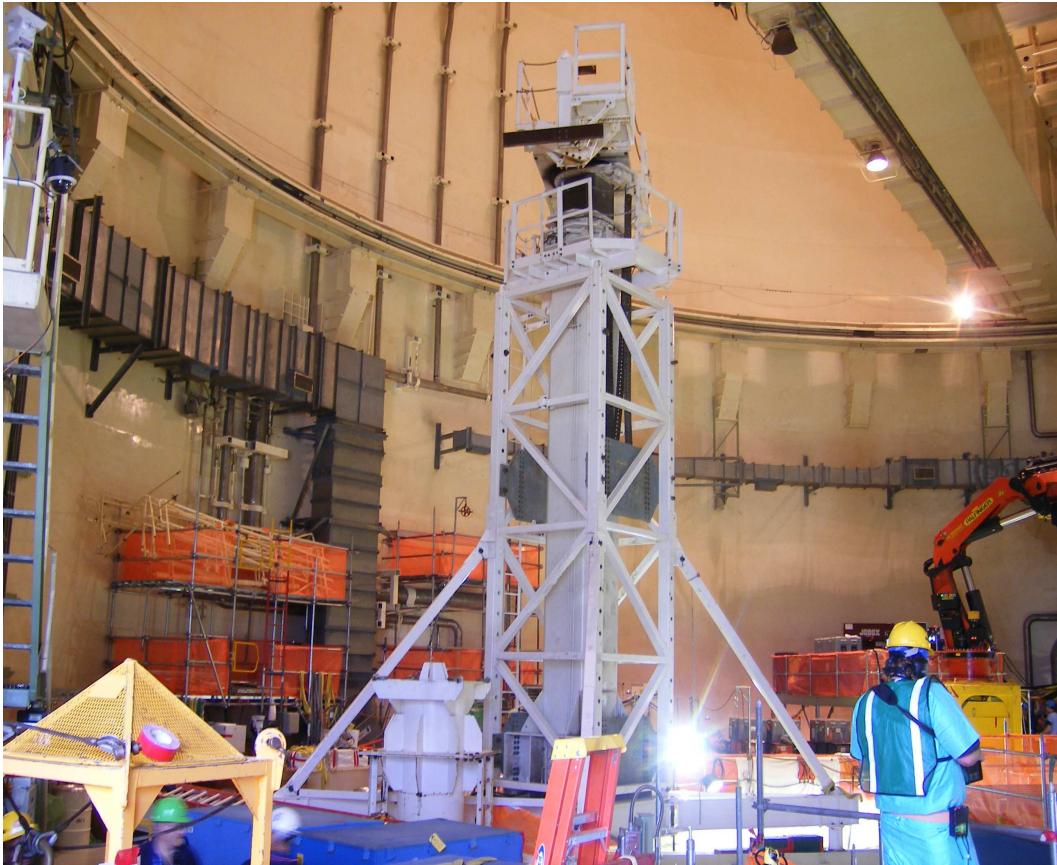


DECOMMISSIONING

- An increasing market for the future (Germany, Switzerland, Italy and Belgium)
- Handling of equipment (RPV & SG)
- Transport of components to lay down or sarcophag
- **References in Germany**
 - Obriechheim
 - Krummel
 - Many references in USA
 - We are doing study for D&D in France



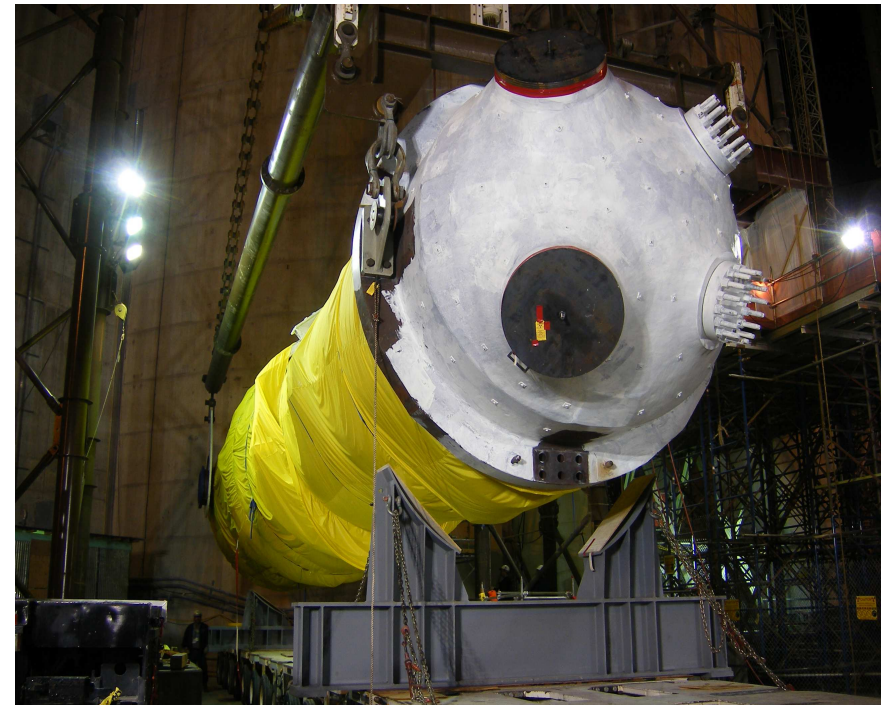
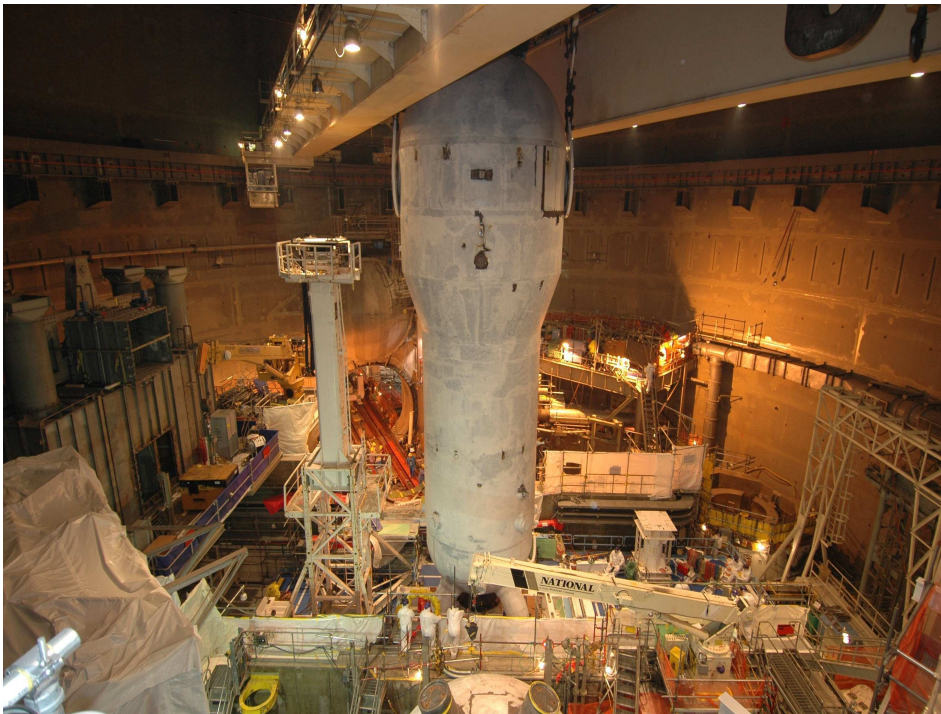
STEAM GENERATOR REMOVAL



OUTSIDE & INSIDE TEMPORARY GANTRY



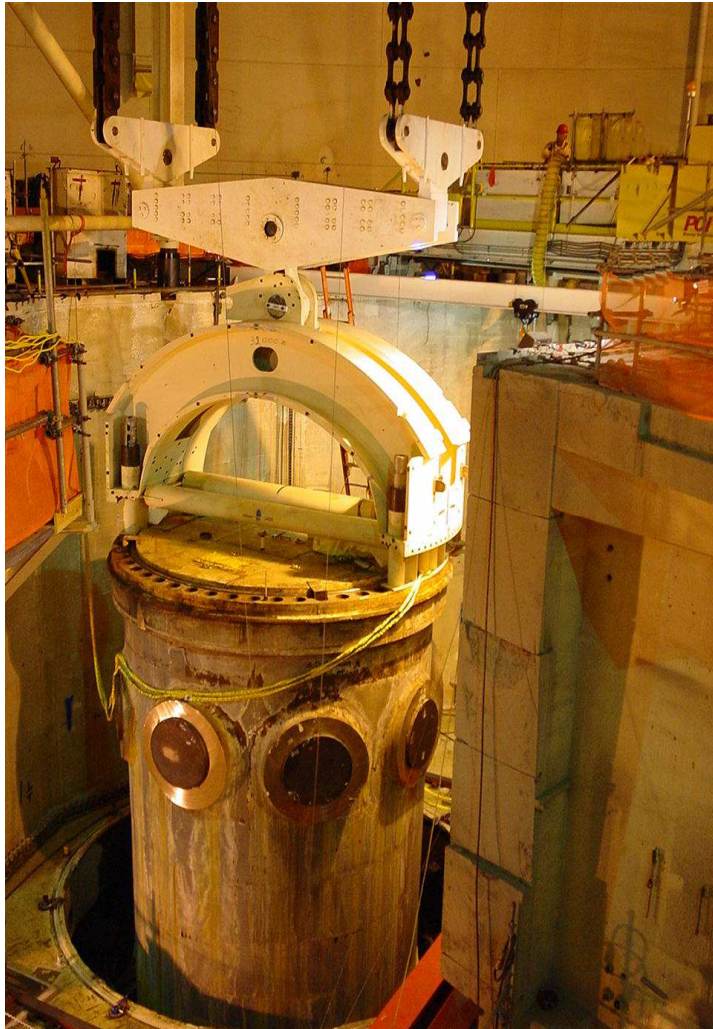
UP-ENDING / DOWN-ENDING EQUIPMENT



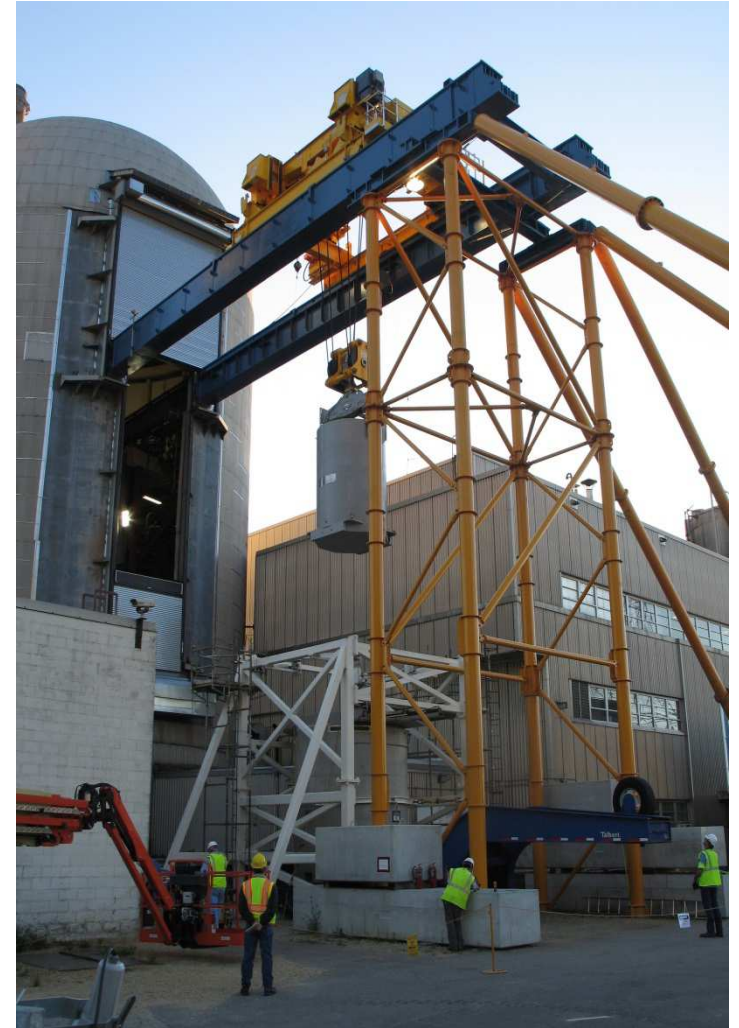
TRANSPORT



HANDLING OF REACTOR PRESSURE VESSEL



CANISTER HANDLING



DRY CASK STORAGE



DISMANTLING OLD CHIMNEY CHERNOBYL



QUESTIONS?



sarens
group

