“Lessons Learned - Construction of the National Enrichment Facility”

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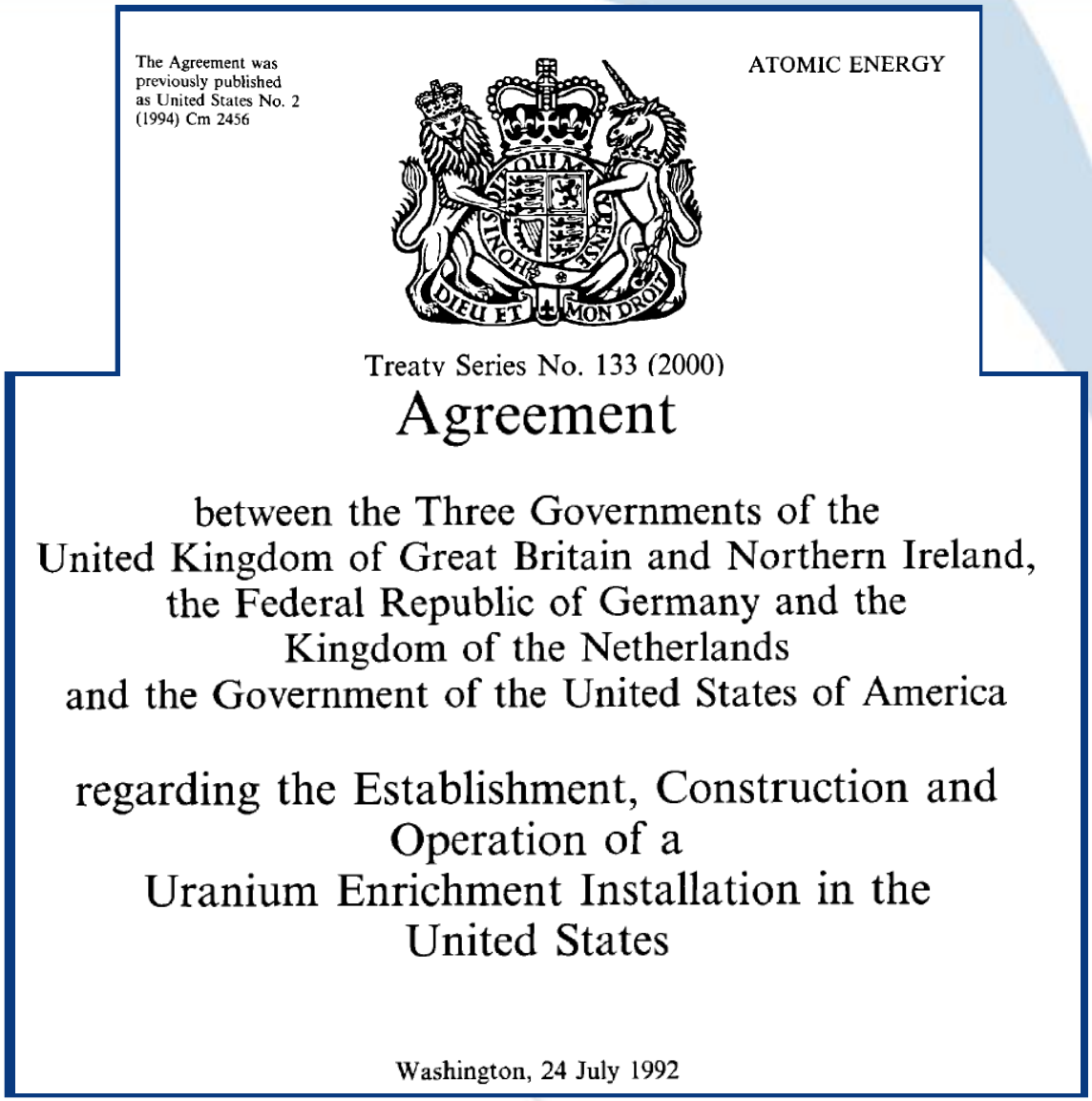
Bio – Stephen Cowne

- With LES for 2 ½ years – Responsible for QA/QC, Licensing and Performance Improvement
- With United States Enrichment Corporation (USEC) for 10 years at Paducah Gaseous Diffusion Plant
- Worked 12 years with Constellation Energy (commercial nuclear power) in engineering, QA, licensing and project management
- Former nuclear naval officer with engineering degrees from Virginia Tech and George Washington University

Who Is LES?



The Agreement was previously published as United States No. 2 (1994) Cm 2456

ATOMIC ENERGY

Treaty Series No. 133 (2000)

Agreement

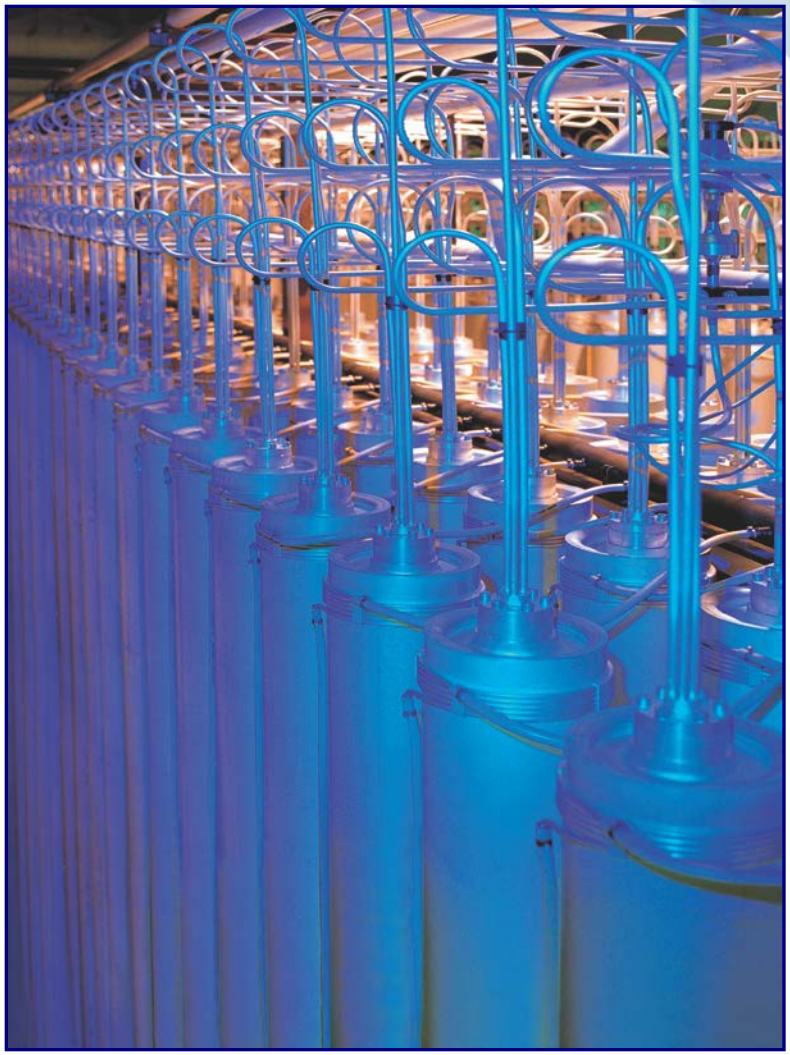
between the Three Governments of the
United Kingdom of Great Britain and Northern Ireland,
the Federal Republic of Germany and the
Kingdom of the Netherlands
and the Government of the United States of America

regarding the Establishment, Construction and
Operation of a
Uranium Enrichment Installation in the
United States

Washington, 24 July 1992

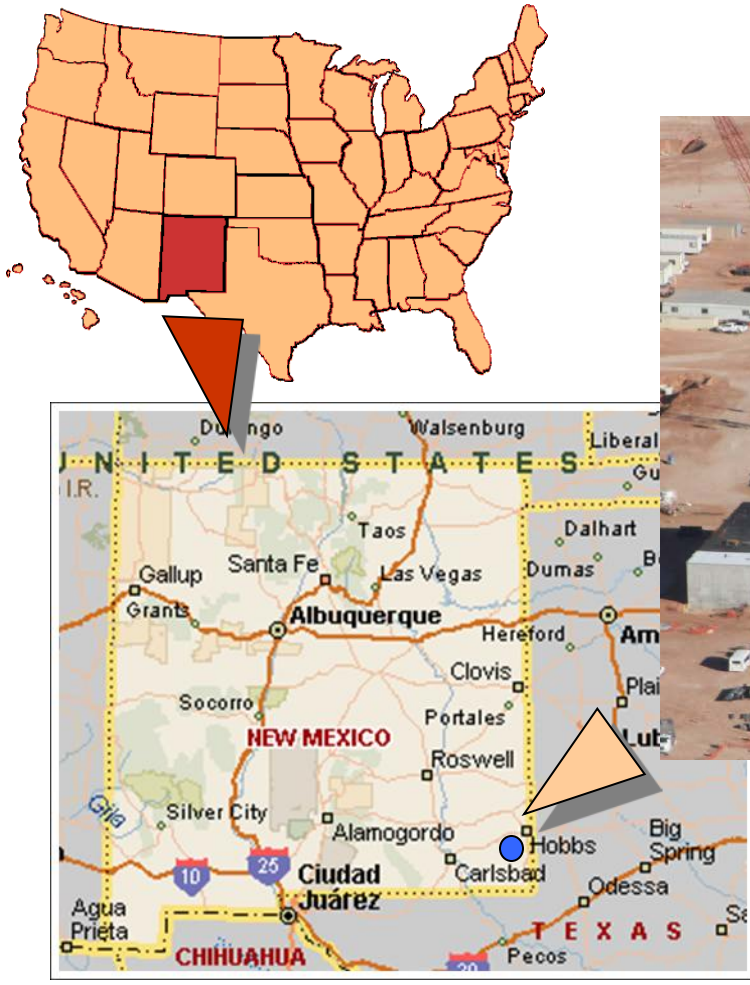
- Louisiana Energy Services LLP (LES) formed in 1990
- The name LES is memorialized in the Treaty of Washington
- LES is 100% owned subsidiary of Urenco Limited

Americanization of European Technology



- Proven to be the world's most advanced, energy efficient, and cost effective technology for enriching uranium
- Successfully operated in Europe for over 30 years
- Technology implemented in three enrichment plants in Europe

National Enrichment Facility near Eunice, New Mexico



"Energy Independence for America"

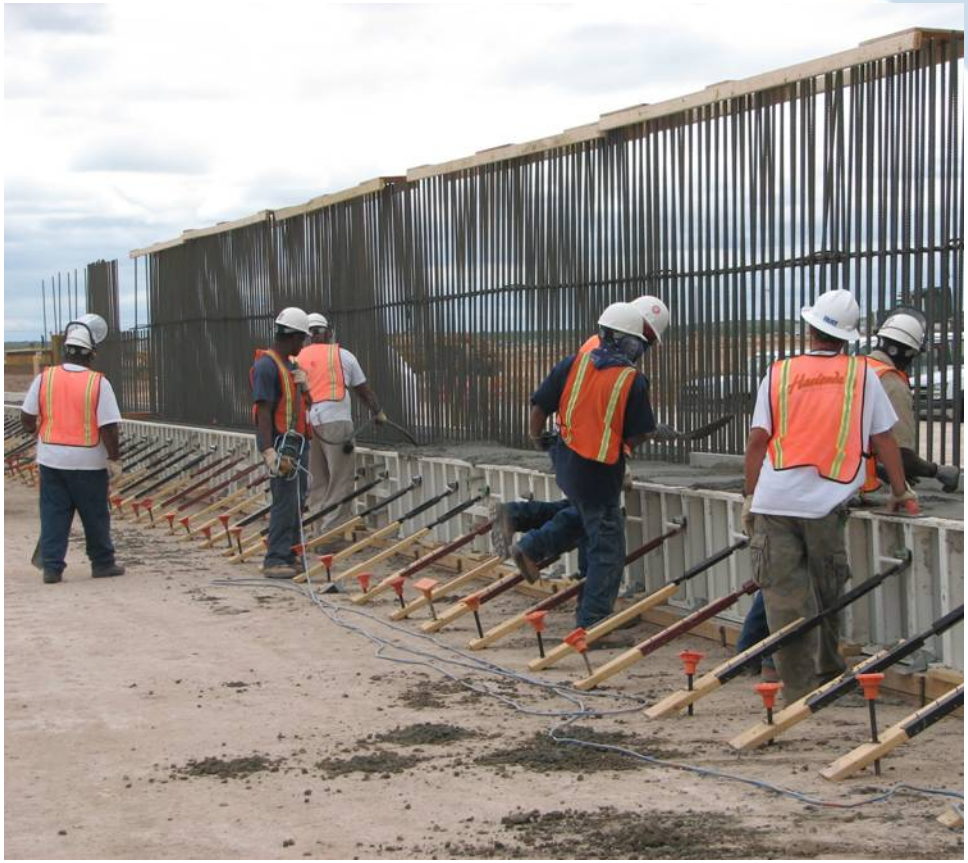
Construction Operating License Received in June of 2006

- Received first COL in the United States
- Chose “greenfield” site near Eunice, NM
- Built from scratch: organization, programs and procedures to function under a COL
- Housing and resource challenges

Aerial View of National Enrichment Facility

- Safety and quality are our overriding priorities
- More than 5.6 million construction man-hours worked without a single lost time accident
- Construction rework rate at 0.188 per 10,000 man-hours
- Site self ID rate is greater than 80% for all groups

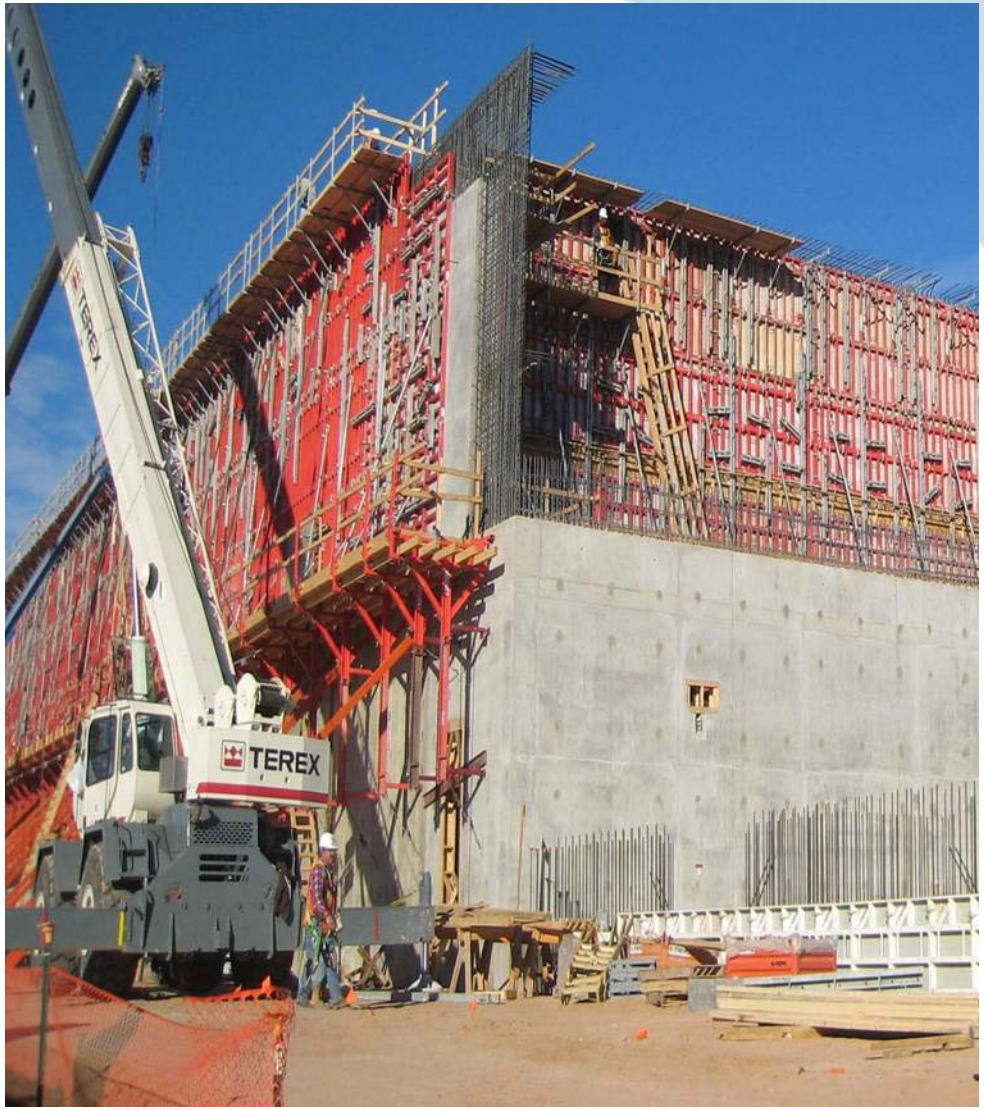
Key Lessons Learned



First NQA1 concrete placement at the National Enrichment Facility

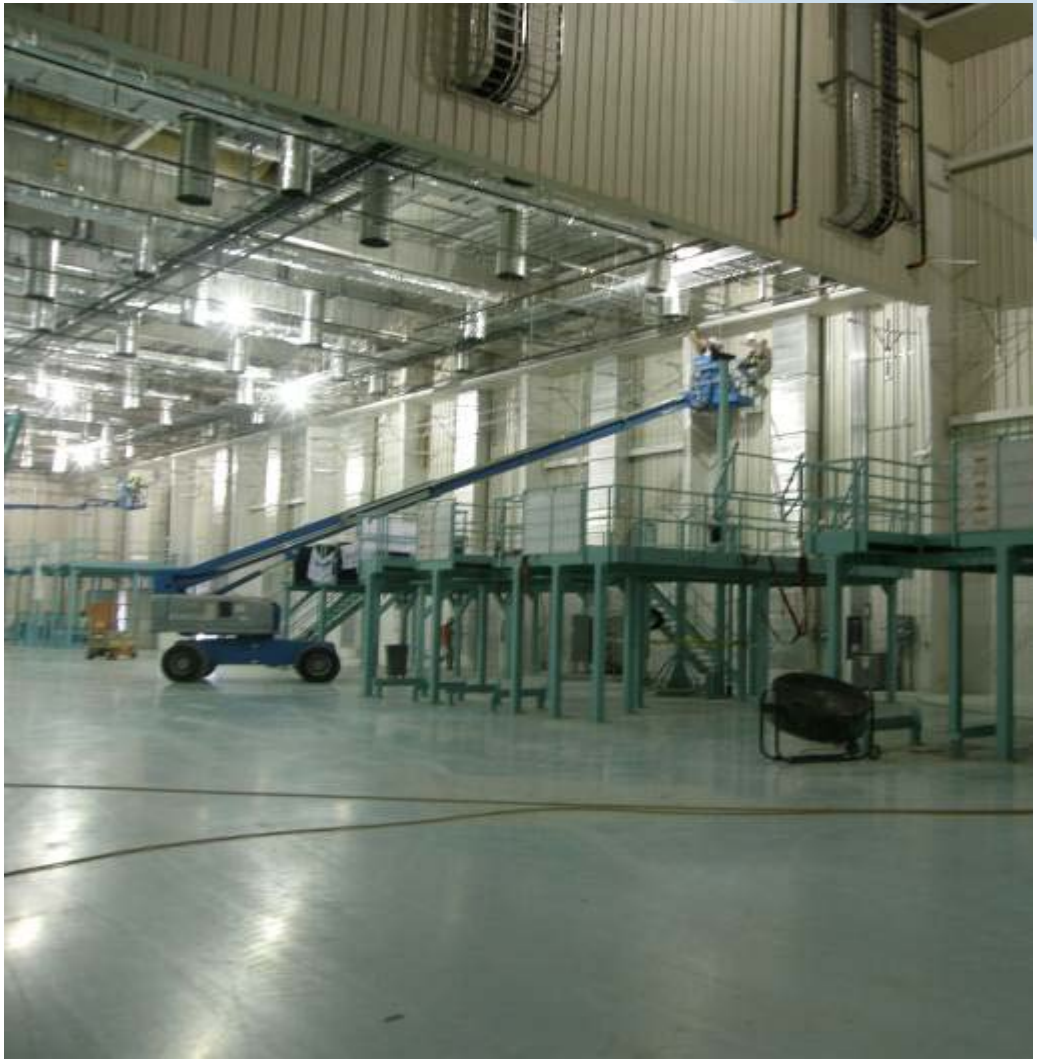
- COL - constructing under an operating license – real time evaluation between drawings and as-builts
- Any deviations from the design require a prompt “operability” assessment against your design basis
- Be clear in license what applies during construction vs. operations

Key Lessons Learned (continued)



- Management programs and procedures in place before you start designing
- Design oversight and reviews at various stages of completion
- Understand your engineering specs
- Design complete before start of construction

Key Lessons Learned (continued)

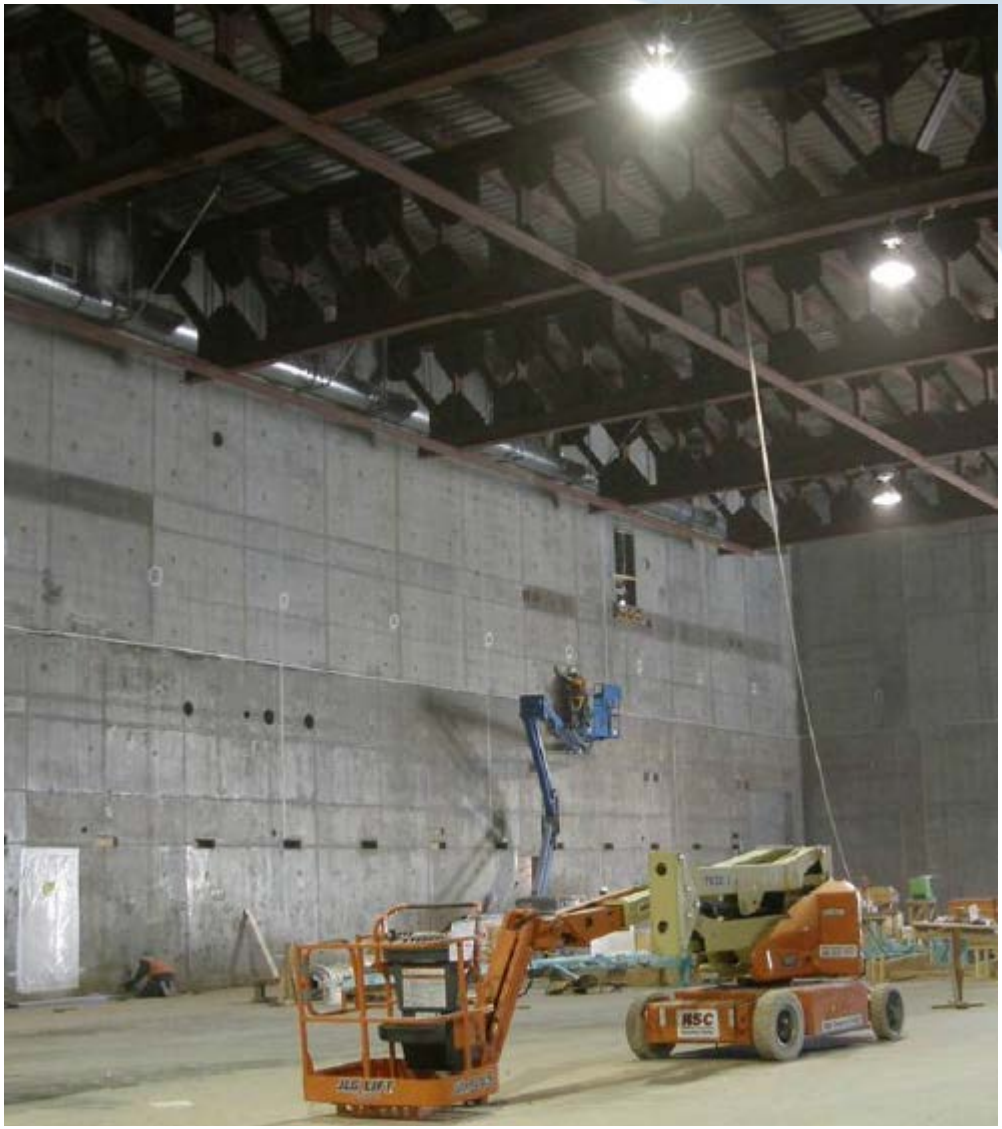


- Planning, planning & planning to keep construction on critical path
- Perform constructability reviews
- Heavy “owner” observation in the field – keep expensive mistakes from happening

Key Lessons Learned (continued)

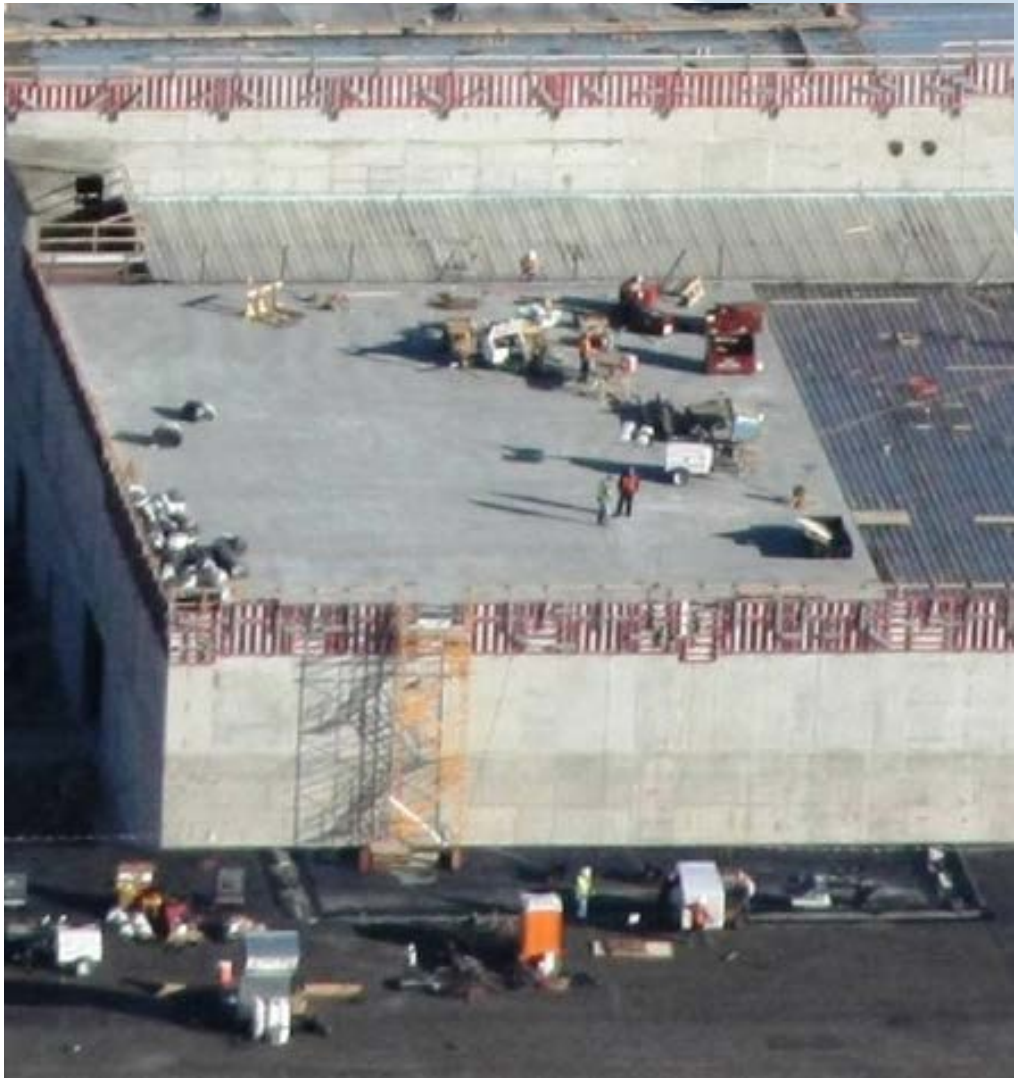
- Emphasize safety and quality over schedule and cost
- Recognize the need for a strong nuclear culture in the work force
- Establish and enforce clear and consistent site standards for verbatim compliance

Key Lessons Learned (continued)



- Procurement requires commercial grade dedication for most NQA-1 equipment
- Qualify offsite vendors early
- Don’t under estimate QA/QC staff size
- Use work plans for all levels of quality
- Involve the end user in oversight

Key Lessons Learned (continued)

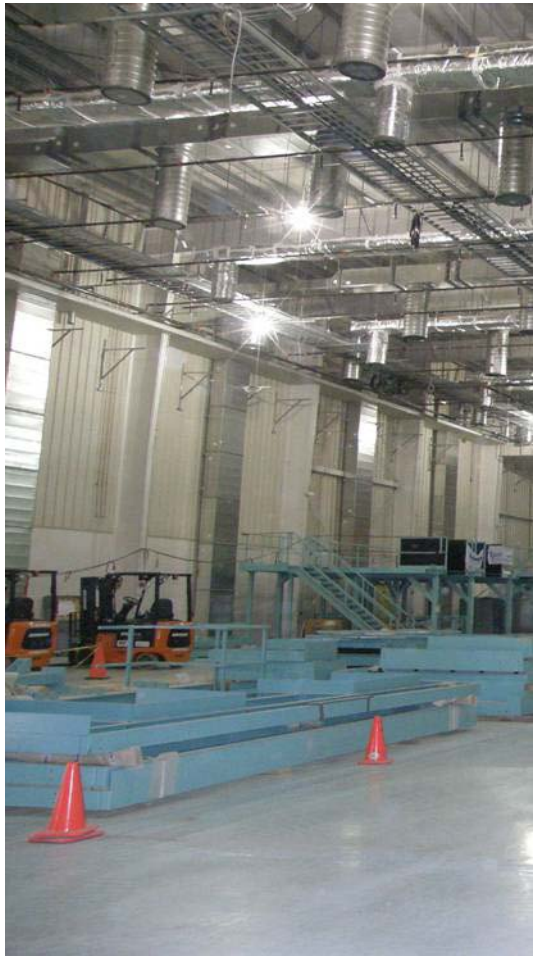


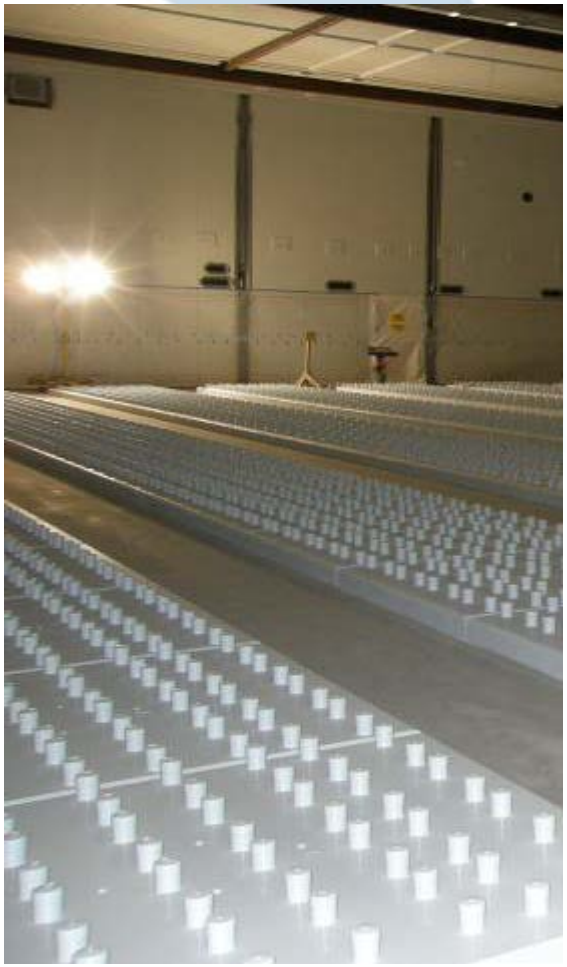
- One CR program for all contractors and departments for the entire site
- One NCR program for all contractors and departments for the entire site
- Ensure actions are tracked and closed properly before turnover

Key Lessons Learned (continued)

- Procedures must be detailed enough for all workers
- Get as many “silverbacks/graybeards” as possible
- Implement your change process immediately and train staff (70.72/USQ/50.59)

Next Steps for the Project





- Began centrifuge testing with UF6 in March
- Start installation of centrifuges in August
- Plant testing and commissioning followed by NRC ORR
- Ready for operations late this year

Conclusions

- The COL process has clear advantages, but constructing under a COL brings new and complex challenges
- Key lessons learned to successfully constructing under a COL revolve around
  - Completeness and flexibility of design
  - Presence of a strong nuclear culture
  - Planning, planning & planning to keep construction on critical path
  - Extensive owner involvement in the field
  - Must have a technically competent, talented QA/QC organization that is very involved in construction activities
  - Have your programs and procedures in place before starting