

NATRIUM

ANS HFICD Next Generation Reactor I&C

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SUBJECT TO DOE COOPERATIVE AGREEMENT NO. DE-NE0009054
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a TerraPower and GE-Hitachi technology

TerraPower
A Nuclear Innovation Company

Natrium™ Demonstration Project Overview

- Objective is to design, license, construct and operate the Natrium commercial demonstration plant
- 7 year schedule to fuel loading
- Licensed by the U.S. Nuclear Regulatory Commission
- Strengthening of the supply chain
- Team members:

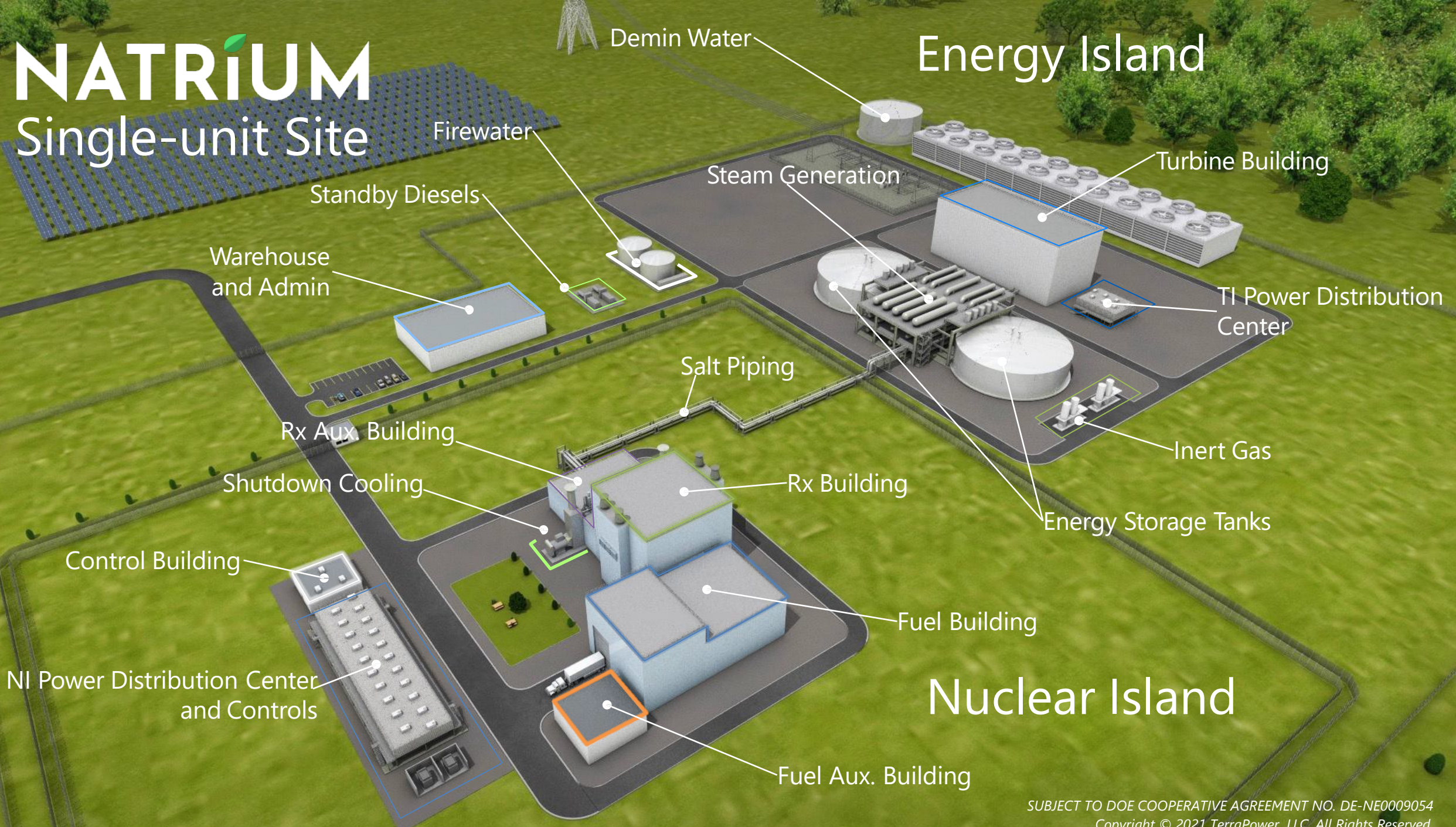


HITACHI



NATRIUM

Single-unit Site



Demin Water

Energy Island

Firewater

Standby Diesels

Warehouse and Admin

Steam Generation

Turbine Building

TI Power Distribution Center

Salt Piping

Rx Aux. Building

Inert Gas

Shutdown Cooling

Rx Building

Energy Storage Tanks

Control Building

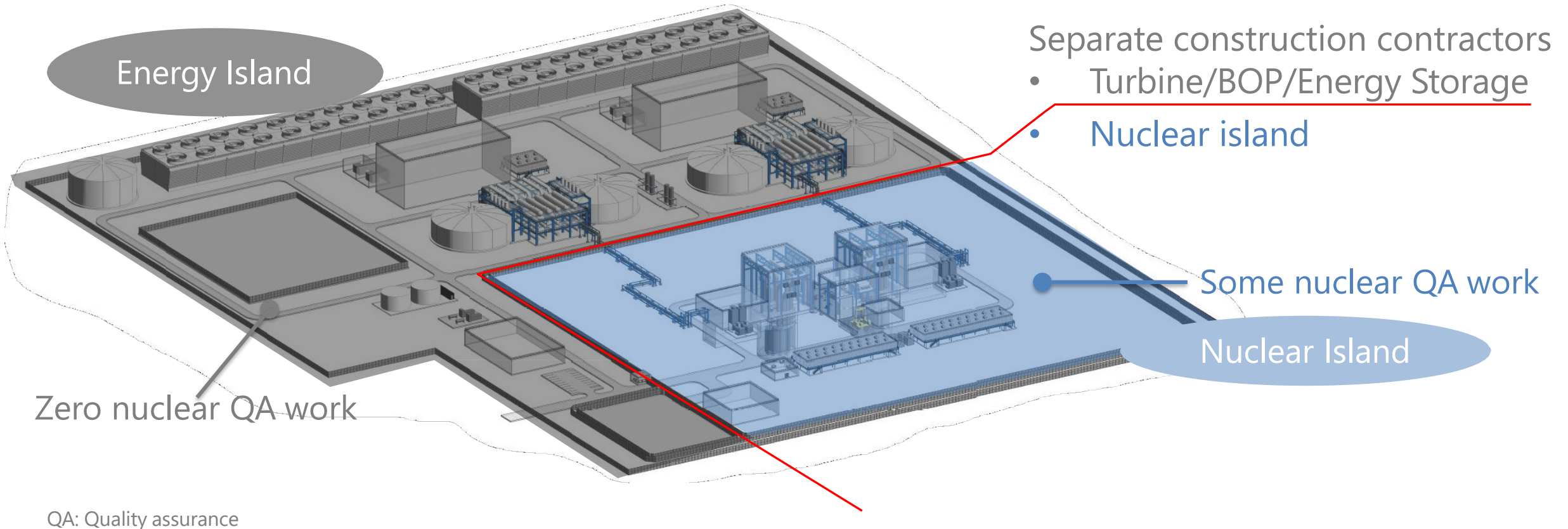
Fuel Building

NI Power Distribution Center and Controls

Nuclear Island

Fuel Aux. Building

A Decoupled Approach

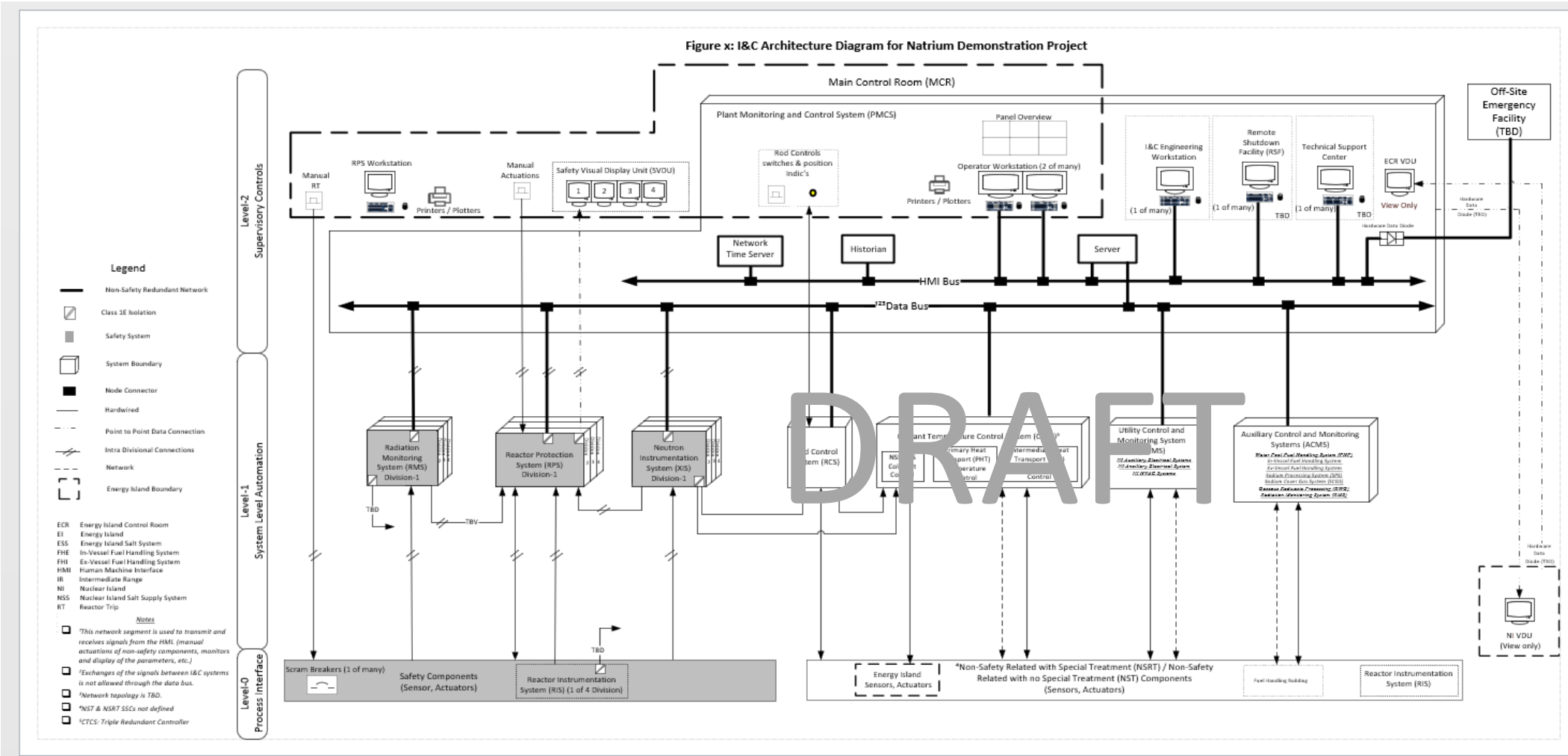


Natrium™ Quality Assurance Commitments

- Regulatory Commitments
 - 10 CFR 50, Appendix B
 - 10 CFR, Part 21
 - Regulatory Guide, 1.28
Revision 5
- Industry Commitments
 - ASME NQA-1, 2015

TerraPower Implements the full Requirements of NQA-1 for all Safety Related (Nuclear) work, and in a graded approach for all other work

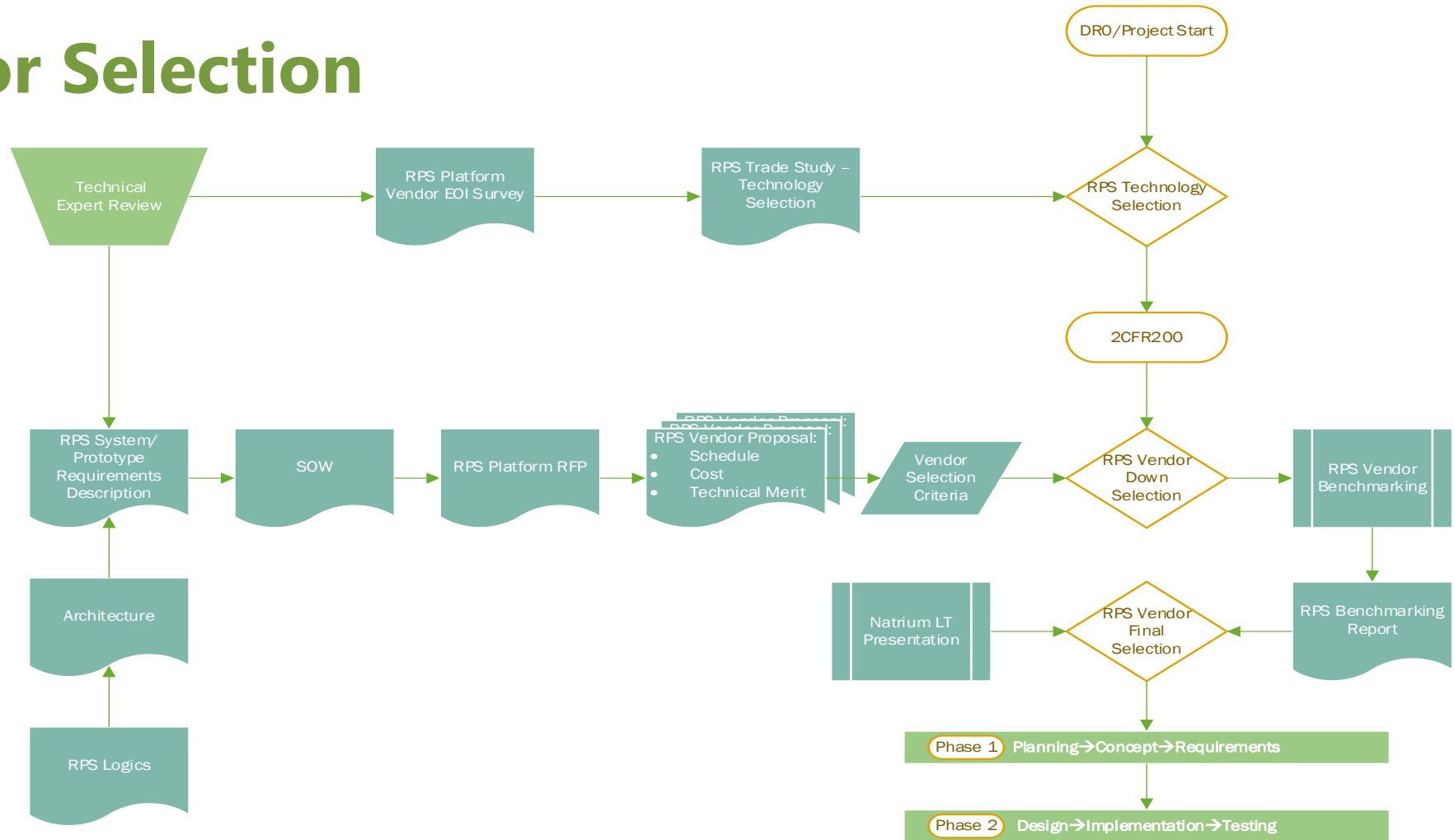
I&C Safety Related Scope of Work



Natrium™ Procurement Overview

- The Advanced Reactor Development Program (ARDP) is a Cooperative Agreement with cost share which means the Natrium Project receives partial funding from DOE, i.e., tax payers dollars.
- Procurements under this project will be solicited and awarded in accordance with 2 CFR 200 procurement standard:
 - Full and open competition is mandatory
 - Small business participation to include socioeconomic SB
 - Fair and reasonable price
 - Records are subject to DOE audit

RPS Vendor Selection



Natrium Reactor Protection System Technology & Vendor Selection

Vendor Selection Criteria

General	Pass/Fail	III – Quality	
Responsiveness to RFP – Bidders must submit all proposal forms		Quality Program - 10 CFR Part 50, appendix B	
Document quality – references, support for claims		NRC Regulations Title 10, Code of Federal Regulations Part 21	
On-time submittal		Cyber programs including SDOE, supply chain, etc are in compliance with industry best practice	
I - Management & Operations		IV - Regulatory Acceptance	
Feedback from previous customers		Regulatory project fit/licensing risk	
Management and technical staff defined and adequate		Diversity/common cause failure - No DAs Required	
Supply chain reliability and quality		V - Business & Contract	
Resource commitments identified and adequate		Total Cost - must be reasonable and supported	
II – Technical		Schedule accuracy and time to Market including supply chain reliability	
Technology Readiness and Maturity		Cost allocation between elements is well defined and supported	
System characteristics including performance, footprint, fit and finish		Contract - acceptance of terms and conditions	
Maintenance, support, training		Assignment of IP	
Prototype, simulator, modeling, or emulation of RPS system.		Country of origin for components	
Reliability determined by PFD		TOTAL	100
Source code/ models for site-specific and platform provided to TP			

RPS Vendor Selection Challenges

- Analog vs. Digital (PLC vs. FPGA)
- Availability of qualified resources
- IP assignment
- Cost/Schedule - Early design may not have enough detail for accurate bids
- QA – Qualification of Vendor to Appendix B/NQA-1
- Codes and Standards – Which version/revision to pick
- Etc.



Questions?

