Used Fuel Disposition R&D Campaign

DOE-Managed HLW and SNF Research Organizational and Procedural Frameworks
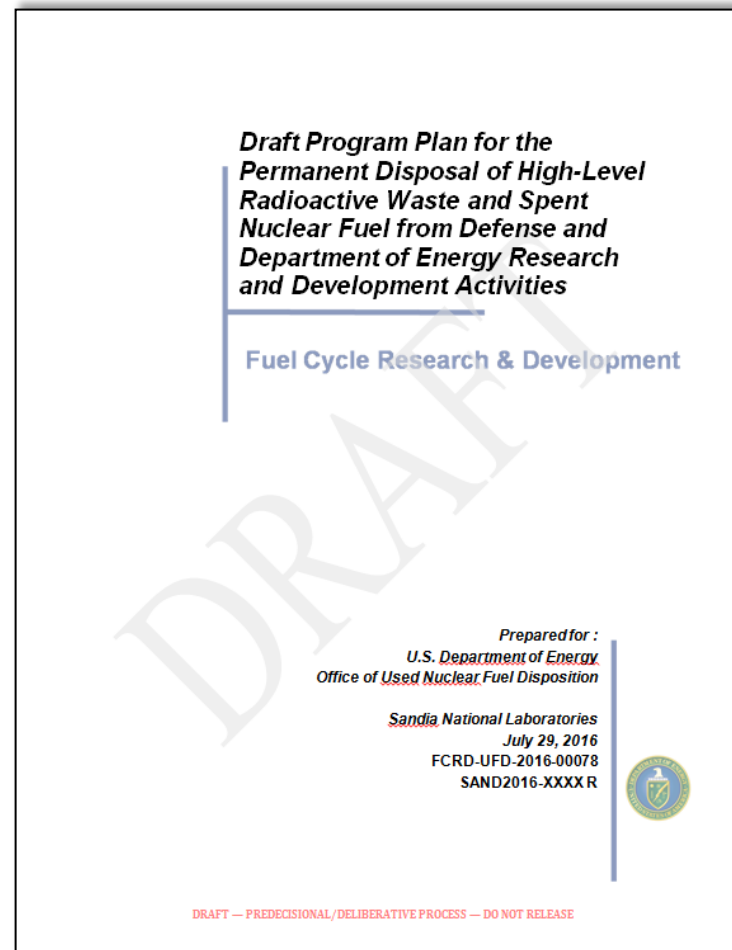
Peter Swift for Gordon Appel

Used Fuel Disposition R&D Campaign

Las Vegas, NV

June 9, 2016

Used Fuel Disposition

Four Work Packages within 1.02.08.05.03

- **1.02.08.05.03: Organizational and Procedural Frameworks**
  - Program Planning (SNL)
    - *Objective: Develop a Draft Generic Program Plan identifying and summarizing the principle elements necessary for a generic repository program for disposal of DOE managed HLW and Spent Fuel.*
    - *L2 Milestone due July 29 2016: Draft Program Plan for the Permanent Disposal of High-Level Radioactive Waste and Spent Nuclear Fuel from Defense and Department of Energy Research and Development Activities*
  - Organizational Framework (SNL)
    - *Objective: develop a draft document identifying and summarizing the principle elements of a generic repository licensing infrastructure and organizational framework.*
    - *L2 Milestone due September 16, 2016: Generic Organizational and Procedural Framework for DOE Managed HLW and SNF Licensing*
  - Develop and Implement Operating Procedures (SNL)
    - *Objective: Develop a draft document identifying and summarizing the principle operating procedures for a generic repository licensing organization*
    - *L4 Milestone due September 16, 2016: Draft Summary of operating procedures needed generic repository licensing*
  - Interactions with Regulator
    - *Not funded in FY16*

DOE Managed HLW and SNF Research: *Program Planning Work Product*

- **Draft report currently in NE-53 review (approx. 70 p.)**
  - Addresses mission, cost, schedule, and organizational framework
- **Final deliverable to DOE will also be a draft report**
  - Primary audience is internal DOE decision-makers
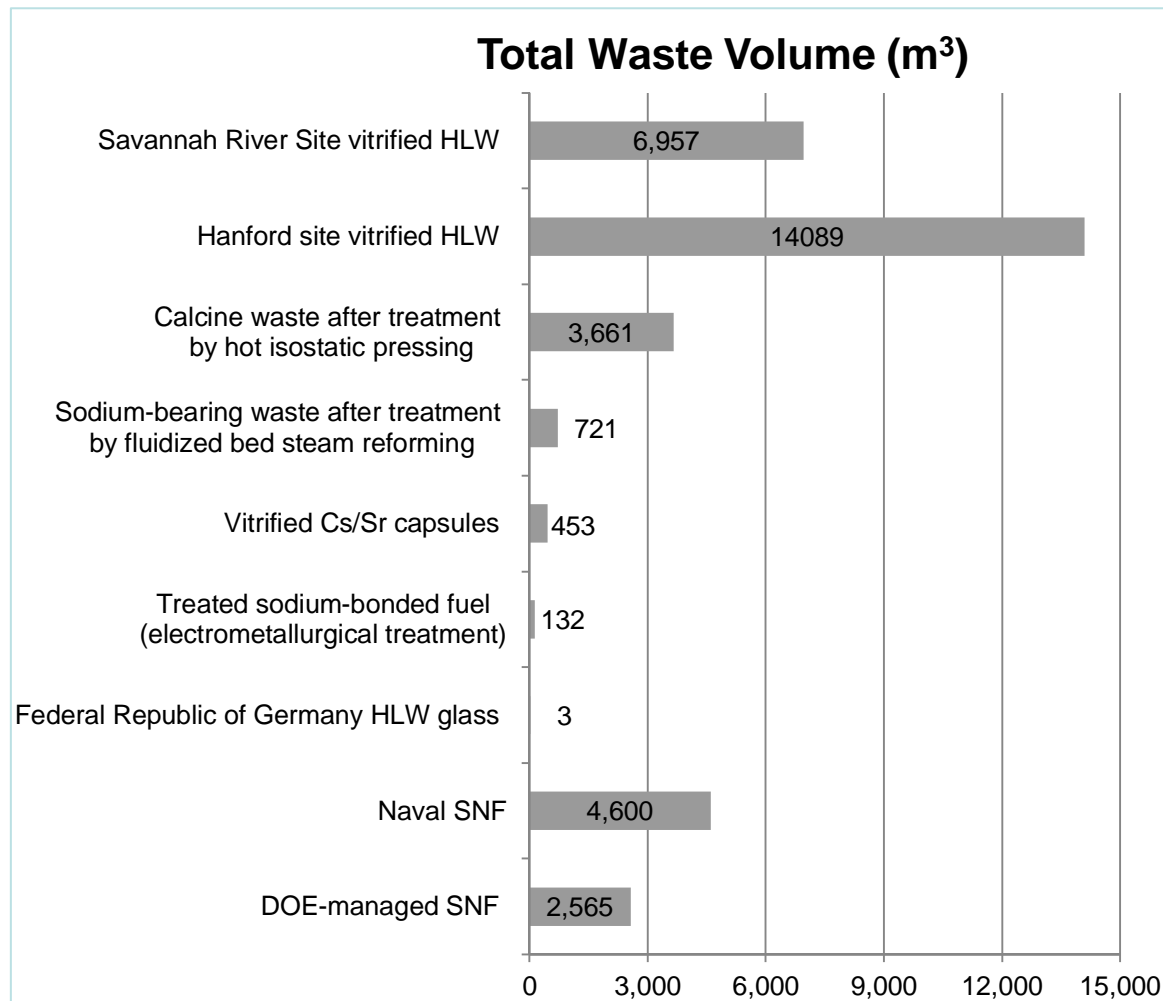 - Goal is to inform DOE planning

Draft Program Plan for the Permanent Disposal of High-Level Radioactive Waste and Spent Nuclear Fuel from Defense and Department of Energy Research and Development Activities

Fuel Cycle Research & Development

Prepared for :
U.S. Department of Energy
Office of Used Nuclear Fuel Disposition

Sandia National Laboratories
July 29, 2016
FCRD-UFD-2016-00078
SAND2016-XXXX R

DRAFT — PREDECISIONAL/DELIBERATIVE PROCESS — DO NOT RELEASE

DOE Managed HLW and SNF Research:
Program Planning Work Product (cont.)

Inventory

Volume of HLW and
SNF derived from
atomic energy defense
activities or DOE
research and
development activities
estimated as of 2048
(SNL, 2014)

Total Waste Volume (m^3)
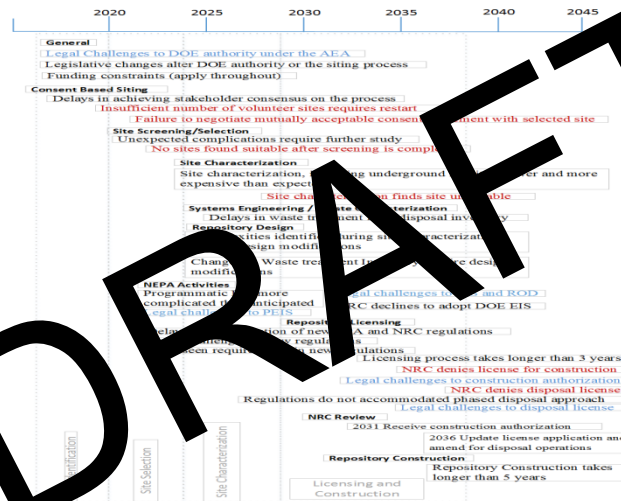
Category	Volume
Savannah River Site vitrified HLW	6,957
Hanford site vitrified HLW	14089
Calcine waste after treatment by hot isostatic pressing	3,661
Sodium-bearing waste after treatment by fluidized bed steam reforming	721
Vitrified Cs/Sr capsules	453
Treated sodium-bonded fuel (electrometallurgical treatment)	132
Federal Republic of Germany HLW glass	3
Naval SNF	4,600
DOE-managed SNF	2,565

Timeline

Risks

Costs

	Site Identification				Site Selection					Site Characterization								
	2017	2018	2019	Cumulative 2017-2019	2020	2021	2022	Cumulative 2020-2022	Cumulative to Date	2023	2024	2025	2026	2027	Cumulative 2023-	Cumulative to Date	Cumulative 2028-2038	Cumulative to 2
Process/ Community Relations	14	16	10.5	40.5	19	16	16	51	91.5	62	62	62	63		312	403.5	536	939.5
Site Screening and Selection	3.5	11	28	42.5	108	150	150	408	450.5	10					10	460.5	0	460.5
Site Characterization				0		5	45	50	50	120	120	120	120		600		540	1190
Waste Characterization	0.5	0.5	1	2	3	3	3	9			5	10	10		35	46	55	101
Repository Design	0.5	0.5	2	3	5	10	17	32		35		55	65	75		310	385	695
NEPA Activities	1	4	4					14		10	10			30		123	130	253
Repository Licensing	0.5	0		2	2	4		13			10	20	25		100	115	165	280
Repository Construction				0				0		100	250	200	90	90	730	730	2800	3530
									0						0	0	180	180
Repository Operations															0	0	200	200
Management Support	3		6		20	20	26	66	78	20	25	25	35	35	140	218	330	548
TOTAL	23	33	42.5	111		212	272	643	754	367	527	517	433	458	2302	3056	5321	8377

Estimated annual program costs from inception through first disposal of waste

DOE Managed HLW and SNF Research:
Establish organizational framework to meet regulator expectations
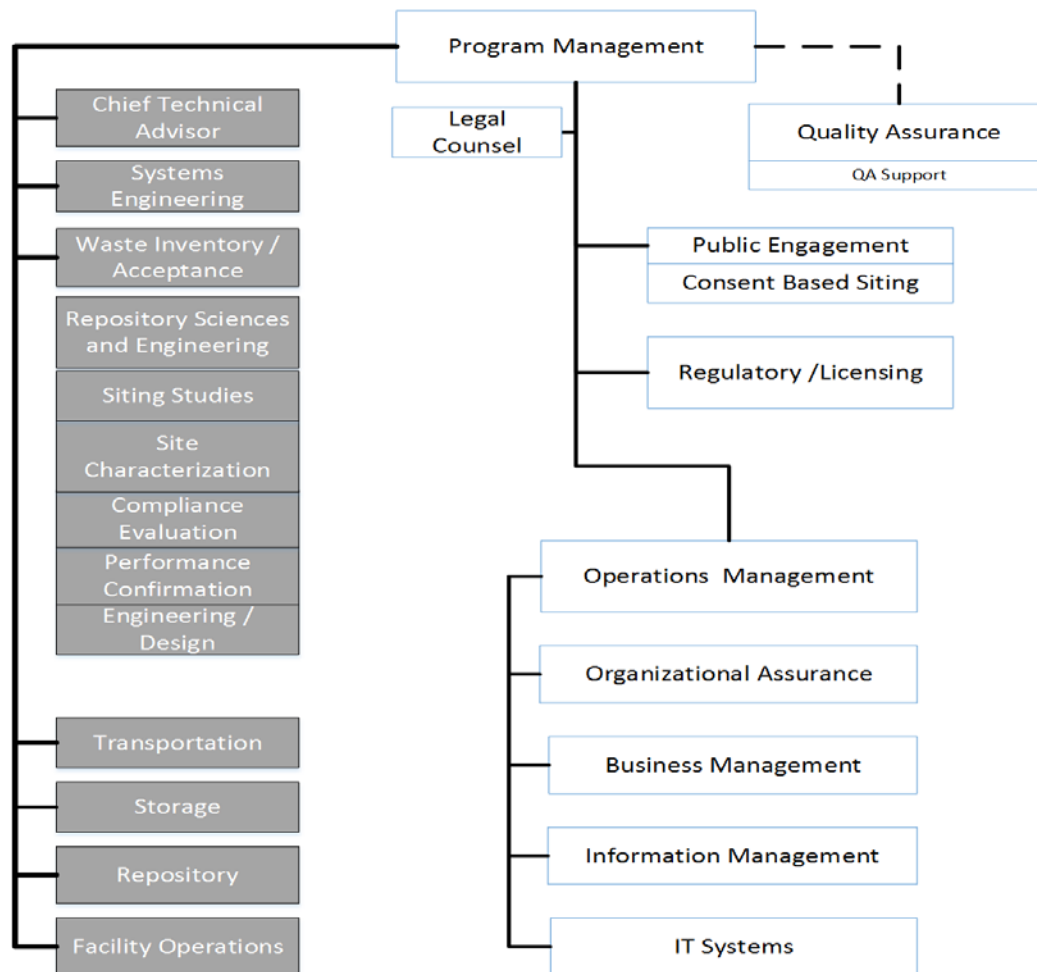
Organization
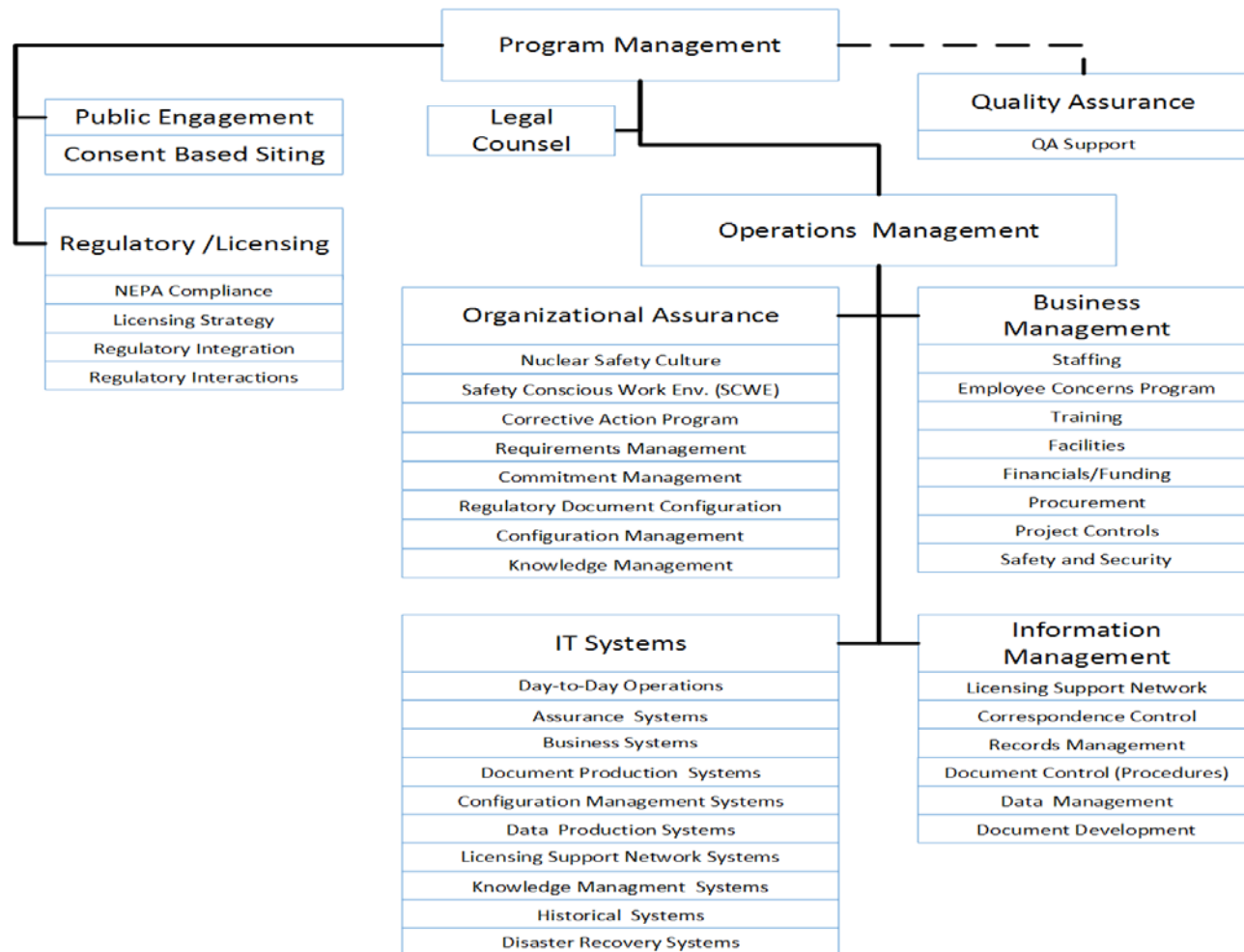
DOE Managed HLW and SNF Research:
Establish organizational framework to meet regulator expectations

# Support Organization (Detail)

Procedures Analysis

- **In 2009 Yucca Mountain had**
  - 9498 controlled documents in CDIS
  - ~ 900 Policies, Plans, Procedures
    - *~750 considering overlap and relevancy*
- **Categorizing by Time Phase needed and owner organizational element**
- **Objective to list Key Procedures by Organizational Element in the Procedure document.**

Organization for Startup Phase

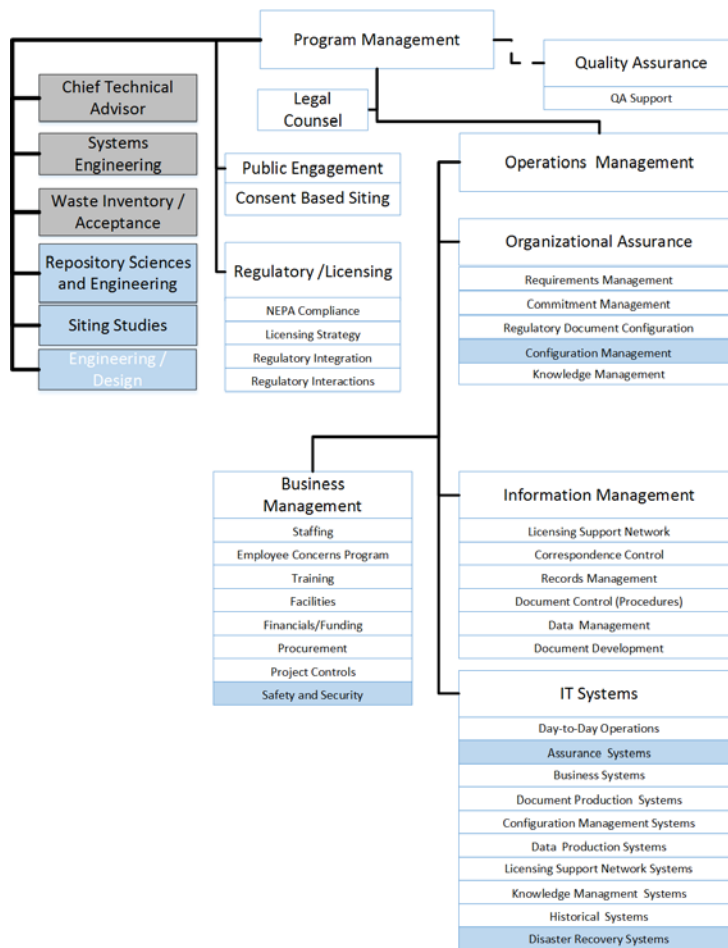**Phase : Startup**
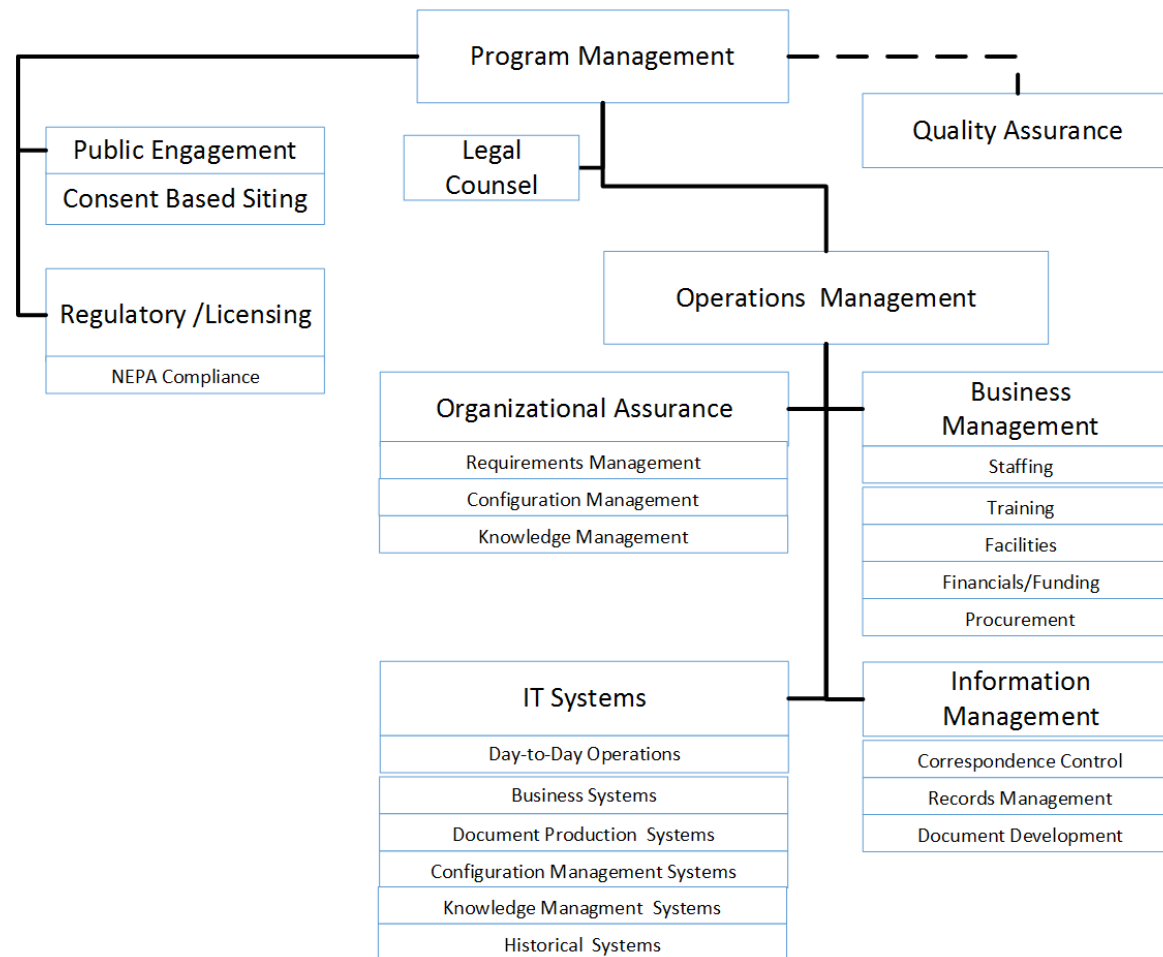
Organization for Initiation Phase

Phase : Initiation
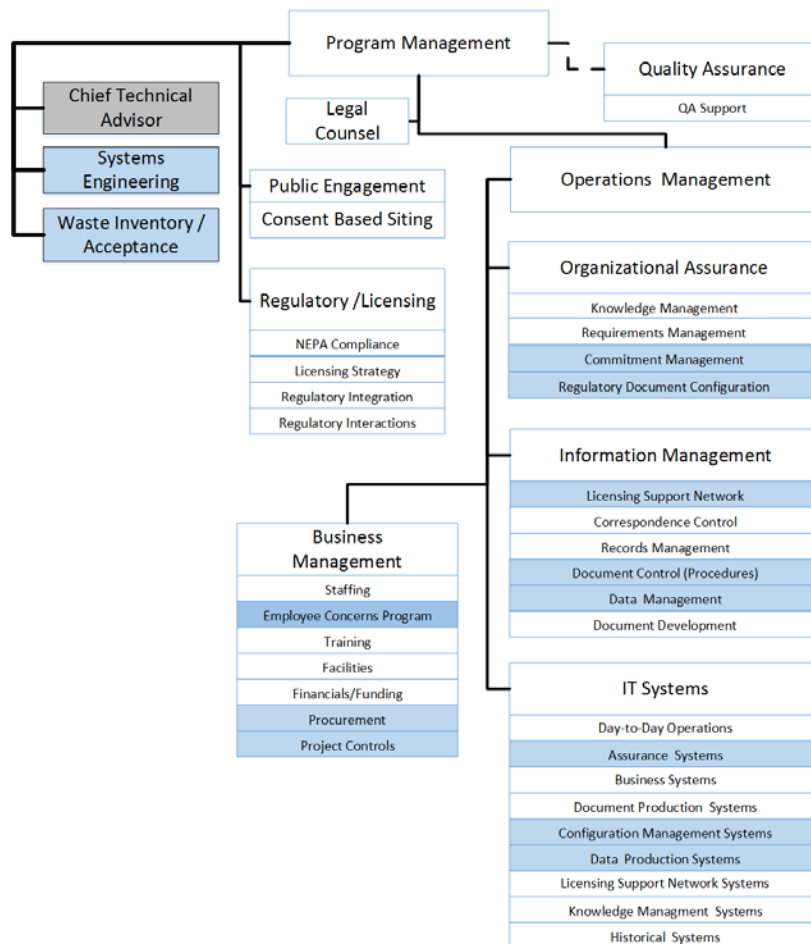
Note: Blue shaded boxes are added in this phase.
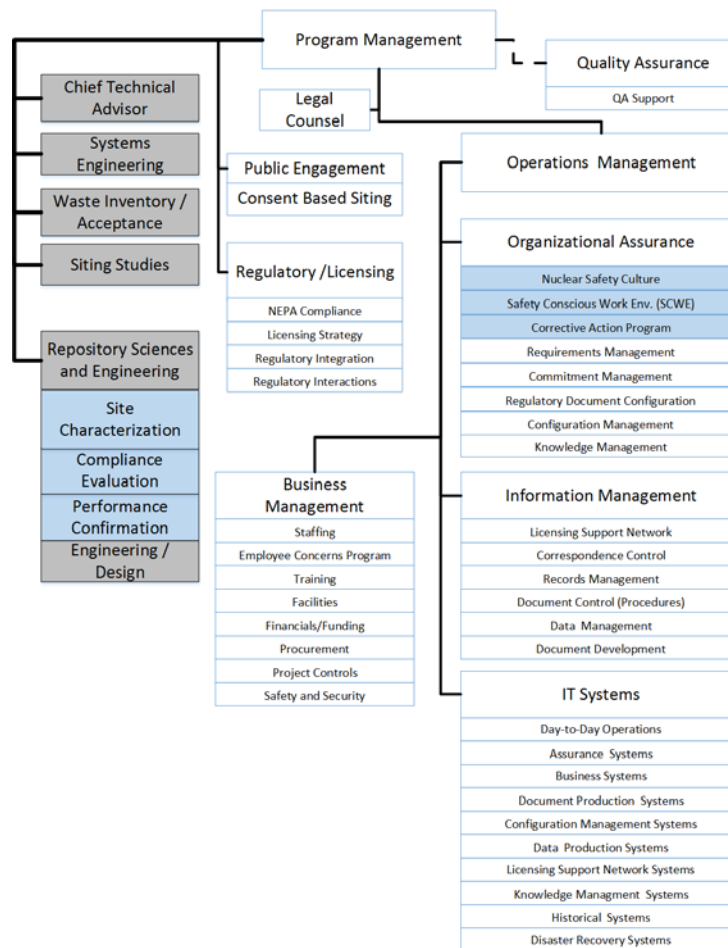
Organization for Siting Phase

Phase : Siting

Note: Blue shaded boxes are added in this phase.

Organization for Site Characterization Phase

Phase : Site Characterization

Note: Blue shaded boxes are added in this phase.

Organization for Licensing Phase

- **Phase : Licensing**