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March 7, 2017

MEMORANDUM

TO: Council members

FROM: Ben Kujala

SUBJECT: Briefing on federal hydro capital investments

BACKGROUND:

Presenters: Bill Leady, Asset Manager, Bonneville
Wayne Todd, Generating Assets Manager, Bonneville

Summary: Bonneville will discuss its strategy for capital investments for the federal hydro system and give specific details on a proposed \$500 million capital investment at Grand Coulee in the third power house.

Relevance: Capital investments made and proposed by Bonneville can impact the future need for Bonneville and regional resources. This has impacts on the resource strategy recommended in the current and future power plans.

Workplan: C. Prepare for the 8th Plan

Federal Hydropower Update

March 15, 2017

Bill Leady P.E.
Asset Manager

Jim Alders P.E.
Reclamation Project Representative
Federal Hydro Project Operations

Bonneville Power Administration



Purpose:

To update the Council on the BPA's asset management program with a focus on investments at Grand Coulee

Agenda:

- ✓ **BPA's changing approach to asset management**
- ✓ **An example of capital investment planning**
- ✓ **Grand Coulee update**

Asset Management

The coordinated activities of an organization to realize value from its assets

The Purpose of Asset Management (AM)

Value

- Assets deliver **value** and achieve their business objectives
- Aligns assets to our customers **value** propositions
- Meet regulatory and statutory obligations
- Safety

Alignment

- AM decisions are informed by asset capabilities, performance, opportunities and constraints
- AM activities are aligned throughout the BPA and considered from a system-wide perspective

Leadership

- Sets clear direction and priorities for asset management
- Organizational structure and culture support AM objectives

Assurance

- Asset will fulfill their required purpose
- AM objectives are achieved consistently and sustainably over time



Asset Management

The Institute of Asset Management Model

Foundational Principles, Guidance, & Authority



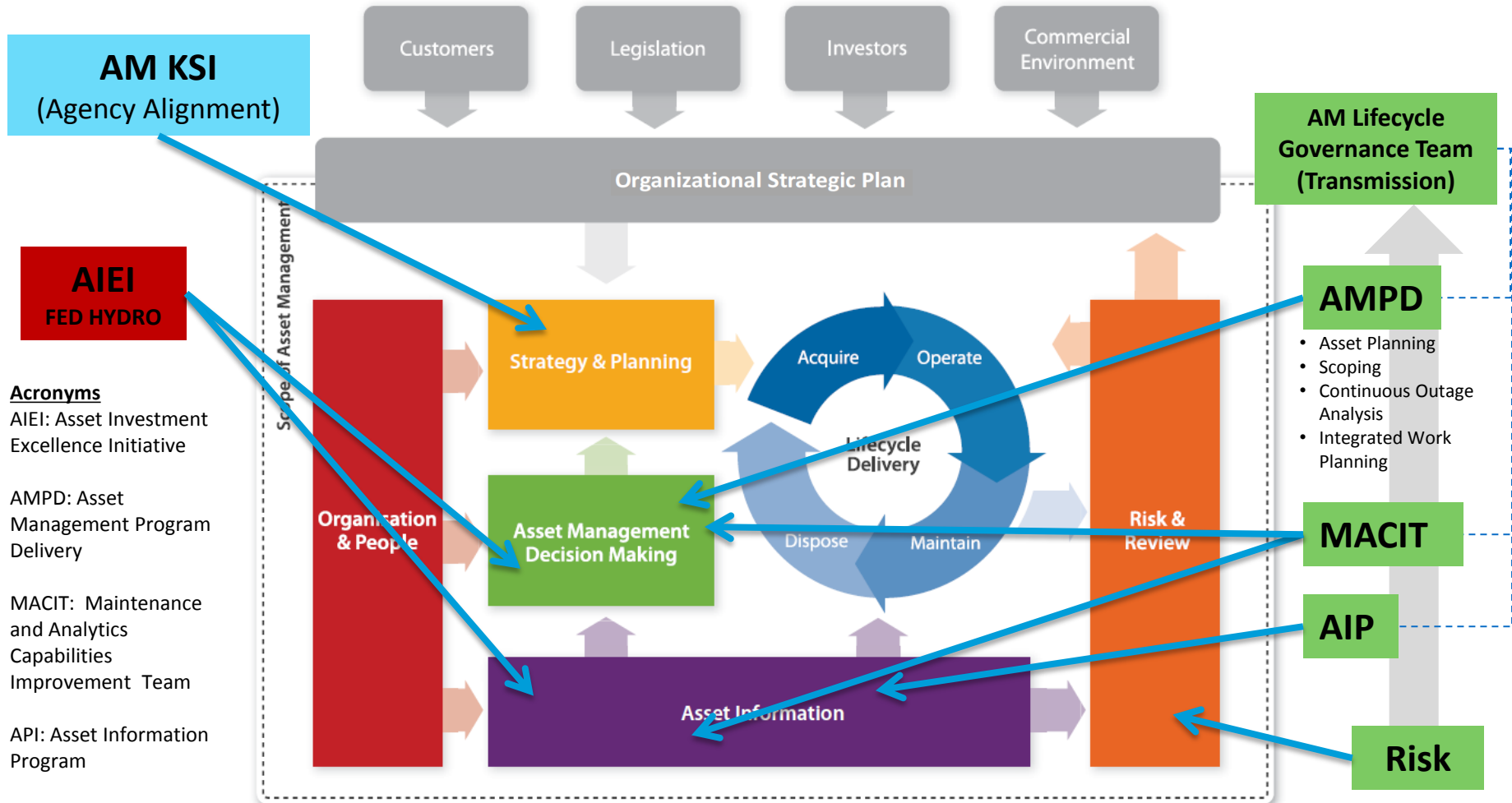
Institute of Asset Management Asset Management System



Based on

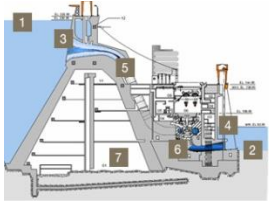
- ISO 55000: AM – Overview, principles and terminology
- ISO 50001 AM - Systems – Requirements
- ISO 55002: AM – Management systems – Guidelines of the application of ISO 55001
- ISO 31000: Risk management – Guidelines and Principals

BPA's Asset Management Key Strategic Initiative (KSI) and Supporting Work



- Acronyms**
- AIEI: Asset Investment Excellence Initiative
 - AMPD: Asset Management Program Delivery
 - MACIT: Maintenance and Analytics Capabilities Improvement Team
 - API: Asset Information Program

Federal Hydropower Capital Asset Planning



Asset Information Systems

- ✓ Economic data
- ✓ Life cycle data
- ✓ *hydroAMP*



Asset Investment Planning
& Management Software

Value
Framework

- X
- Y
- Z



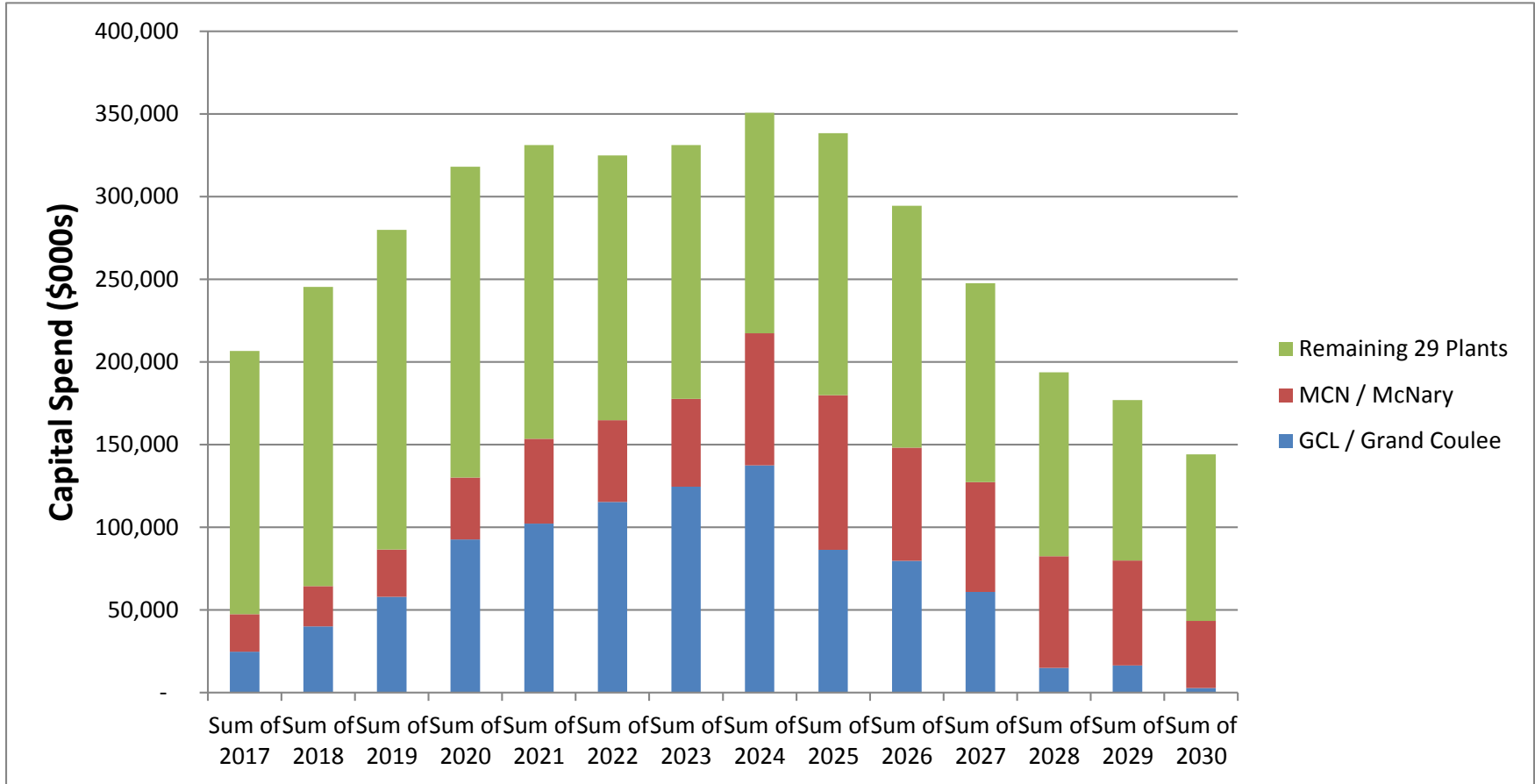
US Army Corps
of Engineers®



Asset
Planning
Team

System
Asset Plan
(annually updated)

Draft 2017 FCRPS Asset Plan



- McNary and Grand Coulee form the backbone of the System Asset Plan in the 2020s, making up about half of the existing projects.
- Note that this chart only includes existing projects and does not include forecasted Capital Investment needs yet to be identified.

Grand Coulee Dam, USBR



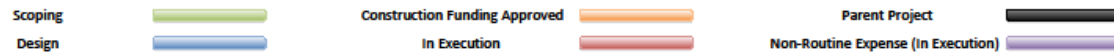
Grand Coulee Major Modernization Efforts

- G1-G18 Runner Replacement (Complete)
- G1-G18 Generator Modernization (Capital)
 - Bid Solicitation in FY17-18
- G22-G24 Overhaul (Non-Routine Expense)
 - Approximately halfway complete
- G19-G21 Overhaul (Capital)
 - Bid Solicitation likely in FY18
- Keys Modernization (Joint Capital and Expense)
 - Several projects in execution to scoping

Grand Coulee Major Projects

Pre-Decisional

Pre-Decisional			Grand Coulee Major Projects FY17 - FY30														Pre-Decisional
ID	Task Name	Current Phase of Work	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
1	Grand Coulee SCADA Replacement	In Execution															
2	230kV Switchyard Safety Overhaul	Design															
3	230kV Switchyard Modernization	Scoping															
4	Replace Town of Coulee Dam Feeders 1, 3, and 4	Design															
5	LPH Station Service Generators LS1-LS3 Modernization	Scoping															
6	Third Powerhouse DC Distribution Boards	Scoping															
7	Grand Coulee Third Warehouse	Scoping															
8	Grand Coulee Spillway Drumgate Floating Bulkhead	Design															
9	Third Powerhouse Main Unit Transformers	Scoping															
10	G11-G18 Main Unit Transformers	Construction Funding Approved															
11	Grand Coulee New Firehouse	In Execution															
12	Grand Coulee Station Service Switchgear and Cable Replacement	Scoping															
13	Third Powerhouse Roof Replacement	Design															
14	G1-G18 Generator Modernization	Parent Project															
15	Penstock Stoplogs	Design															
16	LPH/RPH Crane Control Modernization	Design															
17	LPH/RPH Relay Modernization	Design															
18	Stators and Windings	Construction Funding Approved															
19	Static Exciter Replacement	Construction Funding Approved															
20	Governor Replacement	Construction Funding Approved															
21	Iso-Phase Bus Replacement	Design															
22	G22-G24 Unit Modernization	Parent Project															
23	G22-G24 Overhaul	Non-Routine Expense (In Execution)															
24	G22-G24 Wicket Gates	In Execution															
25	G22-G24 Wear Ring Replacement	In Execution															
26	G19-G21 Unit Modernization	Parent Project															
27	G19 - G21 Overhaul	Design															
28	Third Powerhouse Crane Control Upgrades	Design															
29	John W. Keys Plant Modernization	Parent Project															
30	PG7-PG12 Unit Circuit Breakers	In Execution															
31	P5-P6 Impeller Replacement	In Execution															
32	P1-PG12 Gov, Exciters, Relays, Controls	Construction Funding Approved															
33	Keys Transformer KP10B Replacement	Construction Funding Approved															
34	PG9-PG12 Runner Upgrades and Rewinds	Scoping															
35	PG Phase Reversal Switches	Construction Funding Approved															
36	Crane Control Upgrades	Design															
37	P1-P6 Rewind	Scoping															





Questions / Discussion

