BEFORE THE WASHINGTON

UTILITIES & TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,

Complainant,

v.

PUGET SOUND ENERGY

Respondent.

DOCKETS UE-220066, UG-220067, and UG-210918 (*Consolidated*)

ROBERT L. EARLE
ON BEHALF OF THE
WASHINGTON STATE OFFICE OF THE ATTORNEY GENERAL
PUBLIC COUNSEL UNIT

EXHIBIT RLE-12C

Puget Sound Energy Response to Public Counsel Data Request No. 263, with Confidential Attachment K

July 28, 2022

Shaded Information is Designated Confidential Per Protective Order In Dockets UE-220066, UG-220067, and UG-210918 (*Consolidated*)

REDACTED VERSION

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Dockets UE-220066 & UG-220067
Puget Sound Energy
2022 General Rate Case

PUBLIC COUNSEL DATA REQUEST NO. 263

"CONFIDENTIAL" Table of Contents

DR NO.	"CONFIDENTIAL" Material
263	Shaded information is designated as CONFIDENTIAL per Protective Order in Dockets UE-220066 and UG-220067 as marked in Attachments A, C, I, and K of Puget Sound Energy's Response to Public Counsel Data Request No. 263.

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Dockets UE-220066 & UG-220067
Puget Sound Energy
2022 General Rate Case

PUBLIC COUNSEL DATA REQUEST NO. 263:

Re: Miscellaneous - Puget Sound Energy Internal Audit Reports; PSE Response to Public Counsel Data Request 205.

Please provide copies of the internal audit reports listed in the table below.

Audit title	Year	Month Issued	Description (objectives of the audit)
Western Energy Coal & Transportation Audit – Colstrip Units 3&4	2017	June	Obtain reasonable assurance that fixed and variable production costs, capital additions and retirements, depreciation charges, transportation costs, royalties, and production taxes charged according to agreements were calculated appropriately for the period of January 1 through December 31, 2016.
Get to Zero (GTZ) Audit	2017	July	Phase 1: 2016 GTZ Reporting Methodology Review • Review the data and metrics used to calculate the call savings information displayed on the December 2016 GTZ Dashboard, including metrics on the nine "quick wins." • Identify any reporting gaps and document observations. Phase 2: 2017 GTZ Reporting Methodology Review • Review of FY2017 approach to normalizing call data. • Benchmark the FY2017 normalization and measurement approach against industry best practices.
Colstrip Units 3 & 4 Operations Audit	2017	September	• To obtain reasonable assurance that direct costs charged under the various agreements were accurate and appropriate. Direct costs are those costs that can be directly attributed to Units 3 and 4. • To verify on a test basis that allocated costs charged under the agreements were fairly distributed in a manner that reflected true operational benefits. Allocated costs are those costs incurred at the corporate and plant levels that are distributed to the various operating facilities.
Power Cost Incorporated (PCI) Post-Implementation Audit	2017	October	• Follow-up on the PCI system pre-implementation consulting review observations and recommendations. • Identify any current system issues, project lessons learned, and end-user feedback.
Tacoma LNG Audit	2018	April	• Gain a general understanding of the construction process, timelines, and project constraints. • Review project-to-date spending and agree to corresponding supporting documentation. • Assess the following processes in detail: - General project management controls (budgeting, forecasting/estimating, change orders, cost reporting, scheduling, risk management, quality, etc.) - Contracting and subcontracting (contractor selection process, contractor management, materials management, etc.) - Project accounting (order set up or close out, transaction detail, review process, payment administration, etc.)
Colstrip Units 3 & 4 Coal Supply and Transportation Review 2017	2018	July	Confirm costs billed to the buyers were accurate and in compliance with the Amended & Restated Coal Supply Agreement and related agreements.
Generation Reporting Requirements Audit	2018	October	• Gain an understanding of the reporting environment for generation activities, including operational and environmental reporting to various regulatory agencies. • Independently validate and assess the end-to-end process for verifying accuracy and completeness of reporting for a sample of three generation facilities: -Snoqualmie Falls Hydroelectric Plant -Mint Farm Generating Station -Wild Horse Wind and Solar Facility • Provide recommendations and identify any process improvement opportunities.
Green Direct Program Audit	2019	March	• Understand the following as it relates to the Green Direct program: - Program framework and governance - Regulatory requirements - Key performance indicators and program reporting • Assess the specific processes and controls related to: - Selecting Green Direct customers - Establishing energy providers to support the program - Determining Green Direct customer pricing • Evaluate potential risk areas and/or provide recommendations for improvement.
Tacoma LNG Project Execution Audit - Sprint 1	2020	September	Identify commitments and requirements prescribed by the Order and Joint Operating Agreement, then assess how the Facility is meeting or is prepared to meet these commitments or requirements.
Trading Controls Audit	2020	December	• Assess the adequacy of the governance and monitoring processes including the controls over the procurement and hedging of electricity and natural gas within trading operations. • Assess the use of technology in the execution of controls to identify opportunities to enhance the effectiveness and efficiency of the control.
Tacoma LNG Project Execution Audit - Sprint 2	2021	February	• Understand PLNG Director and North American Energy Services Leadership roles, responsibilities, and activities assigned or transferred to them • Assess pre-commercial operational risks • Review operating procedures and documentation to identify any gaps • Review gas procurement contract and identify any gaps

FERC Voluntary Index Reporting Audit	2021	August	• Review the Policy Statement for any changes and determine that any required updates are reflected in the Code of Conduct and associated policies and procedures specific to index reporting. • Obtain reasonable assurance that FERC voluntary index reporting of energy and natural gas transactions are complete, accurate, and in conformance with the Policy Statement, any other agreements, and internal policies and procedures.

Response:

Attached as Attachments A through L to Puget Sound Energy's ("PSE") Response to Public Counsel Data Request No. 263, please find the requested audit reports. Please refer to the table below for the list of audit reports by Attachment number.

At the time of their creation, the reports were classified as confidential according to internal PSE guidelines. Therefore, each of the documents have original generic markings of confidentiality. However, most of the content in these reports does not contain confidential information as defined by the protective order in this proceeding. Even so, certain information within the audit reports does meet the requirements for confidential treatment under the protective order, as designated below. As such, only the information marked as confidential in accordance with the protective order requires such treatment.

Audit title	Year	Month Issued	Reference
Western Energy Coal & Transportation Audit – Colstrip Units 3&4	2017	June	Attachment A (C)
Get to Zero (GTZ) Audit	2017	July	Attachment B
Colstrip Units 3 & 4 Operations Audit	2017	September	Attachment C (C)
Power Cost Incorporated (PCI) Post-Implementation Audit	2017	October	Attachment D
Tacoma LNG Audit	2018	April	Attachment E
Colstrip Units 3 & 4 Coal Supply and Transportation Review 2017	2018	July	Attachment F
Generation Reporting Requirements Audit	2018	October	Attachment G
Green Direct Program Audit	2019	March	Attachment H
Tacoma LNG Project Execution Audit - Sprint 1	2020	September	Attachment I (C)
Trading Controls Audit	2020	December	Attachment J
Tacoma LNG Project Execution Audit - Sprint 2	2021	February	Attachment K (C)
FERC Voluntary Index Reporting Audit	2021	August	Attachment L

ATTACHMENTS A–L to PSE's Response to Public Counsel Data Request No. 263

SHADED INFORMATION IS DESIGNATED AS CONFIDENTIAL PER PROTECTIVE ORDER IN DOCKETS UE-220066 AND UG-220067

Tacoma LNG Project Execution Audit

Sprint 2 Report - Operations

PUGET SOUND ENERGY

February 2021

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Executive Summary

PUGET SOUND ENERGY

Sprint 2: Operations requirements review

We reviewed 26 requirements critical to operating the Tacoma LNG Facility (the Facility), with 3 resulting findings and 14 optimization opportunities identified to prioritize action as needed

What we've done

- Identified and agreed on a list of 26 operations and commercial requirements that are critical to operate the Facility in a safe, regulatory compliant and profitable manner
- Reviewed operational documents and interviewed key stakeholders to provide a perspective on whether the requirements are met and if opportunities exist to optimize current plans to achieve industry leading practices
- Identified potential improvements/actions to address observations – **3 findings, 14 optimization opportunities**
- Assessed Tacoma LNG asset value/returns using latest sales assumptions – **current IRR** [redacted]
- Created a list of tailored levers to improve Tacoma LNG value/returns – **spanning volume, margin and enablers**

Objectives of this document

- Highlight the findings and optimization opportunities to facilitate actioning as necessary prior to start-up
- Frame the current financial outlook and surface tangible levers that may be available to improve asset value
- Aid in aligning next steps and timing

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Notes: (1) Based on pro-forma economics provided by Management as of November 2020.

Sprint 2: Operations context

Tacoma LNG is PSE's first liquefaction venture, and while there are experienced contractors in place, challenged economics and complex structure necessitate a focus on value and effective operations

First time operating liquefaction facility	• **Tacoma LNG is PSE's first venture** in which it will operate a liquefaction plant and provide bunkering, though there are similarities to other facilities it operates • An **experienced third party operator (NAES) will operate and maintain the plant**, with technical support provided by LNG subject matter experts (SMEs) from Lisbon Group • Leading practices to operate the plant will be brought to bear, but **proactively highlighting** the key operational **differences with LNG assets is critical** to safe, effective and efficient operations
Asset performance is critical with challenged economics	• **If asset returns are comfortably above investment thresholds**, a less experienced owner can lean on experienced contractors and refine operations over time, while still achieving acceptable economics • In the case of **Tacoma LNG, asset economics are challenged**, and a "slow-go" approach to improving operations over time could forgo key opportunities to bring economics closer to target metrics • Therefore, it is critical to **promptly identify key value levers** and **institute plans to quickly execute and maximize their benefit** to improve value
Complex ownership structure	• Further exacerbating economic challenges is the **ownership structure** and operational plans that involve Tacoma LNG producing distinct LNG products for PSE and PLNG • PSE and PLNG are separate entities, and their products are incorporated in separate profit and loss statements (P&Ls), though both entities are owned by Puget Energy • Some operational roles are shared across PSE/PLNG, while others are distinct. **Ensuring operational and financial responsibilities are clear** and effective is critical to maximizing both parties' interests.

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Sprint 2: Operations observations

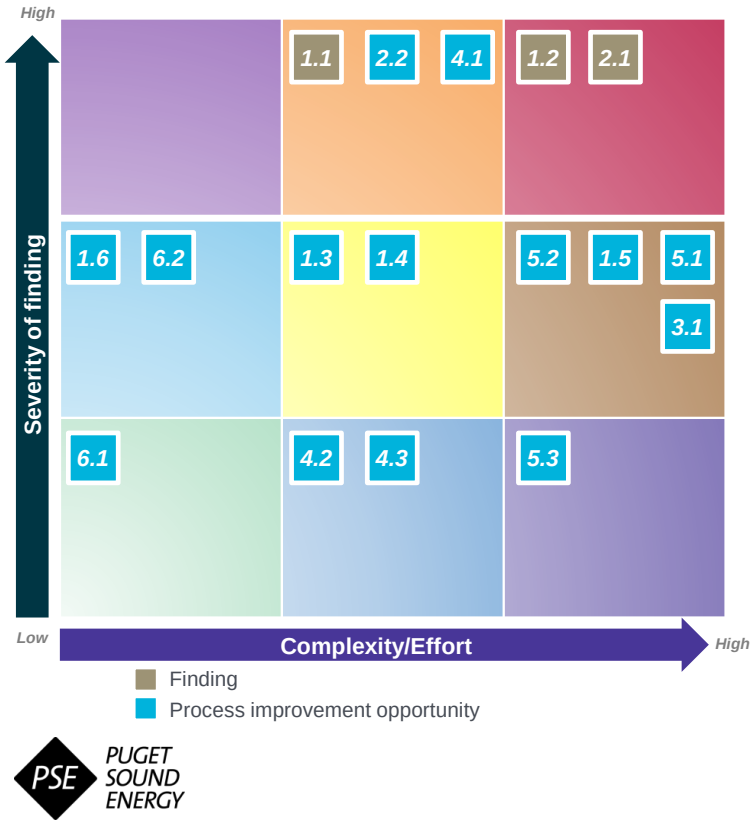
Our review identified findings critical to address before start-up, as well as optimization opportunities that could help elevate current plans to industry leading practices

Operational and commercial requirements checked			Resulting count of observations			
ID	Requirement area	Summary of observations	Findings	Optimization opportunities	No findings	Total
1	Operations	Most processes are in-place to safely operate the plant, though actions are needed to mitigate single points of failure and impact to equipment from regular plant cycling. Optimization levers exist to improve stewardship of reliability and efficiency.	2	4	4	10
2	Performance management	Although operational responsibilities are clear, unclear economic responsibilities may inhibit profitability. Establishing scorecards for NAES (planned) and the Facility, and ensuring KPIs are LNG-tailored could enhance safety and profitability.	1	1	-	2
3	Trading	The same PSE trading group is planned to purchase gas for PSE and PLNG. Having distinct PLNG traders and allowing optionality for PLNG gas purchases may improve margins.	-	1	-	1
4	Commercial	Selling out plant capacity slipped from 2022 to 2027, reducing Tacoma LNG's IRR to [redacted]. Exploiting levers to bolster the sales pipeline, manage boil off gas (BOG) and commercialize by-products could improve asset financial results.	-	3	-	3
5	Maintenance	The maintenance management system, equipment strategies, and safety processes are set-up/on-track. Enhancing key processes (e.g., work scheduling, RCFAs (root cause failure analysis)) and proactively identifying turnaround drivers could improve reliability and opex costs.	-	3	3	6
6	Procurement/ material mgt	Procurement processes are in-place, and the inventory management system is being updated with equipment data. Establishing processes to systemically leverage scale with purchases and manage inventory could reduce stockouts and costs.	-	2	1	3
7	Operating model	The initial (Operations & Management) O&M organization has been right-sized based on experience and competitive bidding. Verifying costs are consistent with market is required per the Joint Ownership Agreement (JOA). Benchmarking could enable verifying costs and confirming org size/structure.	-	-	1	1
		TOTAL	**3**	**14**	**9**	**26**

Notes: (1) Based on pro-forma economics provided by Management as of November 2020.

Sprint 2: Complexity to address operations observations

Plotting Sprint 2 Requirement Observations by impact and complexity/effort highlights moderate change is involved in addressing most areas, reinforcing need for timely action and careful planning



		Summary findings/improvement opportunities
Findings	1.1	**Single point failures:** Risks from single point failures need more rigorous assessment and tangible steps taken to address the risks
Findings	1.2	**Ramp up/down impact mitigation:** More work is needed to assess and mitigate impacts of regularly cycling the plant on and off
Findings	2.1	**Economic accountability:** A lack of defined economic responsibilities may hinder effective operations and maximized profitability
Potential Improvement Opportunities	1.3	**Refining ramp up/down processes:** Revise procedures to integrate actions to mitigate and measure high and medium impact risks
Potential Improvement Opportunities	1.4	**RAM analysis:** Perform RAM (reliability, availability, maintainability) analysis to create a baseline that the PSE Asset Manager can use to help steward plant operations
Potential Improvement Opportunities	1.5	**Identifying and tracking downtime:** Utilize a volume-based, empirical approach to determine production potential and downtime
Potential Improvement Opportunities	1.6	**Plant operating procedures and systems:** Verify that Real Time Optimization (RTO) technology is being utilized to enhance plant efficiency
Potential Improvement Opportunities	2.2	**NAES and Tacoma LNG performance scorecards:** Establish scorecards to steward performance both NAES and the Tacoma LNG facility as a whole
Potential Improvement Opportunities	3.1	**Gas trading procedures:** Increase the flexibility of gas purchases to make another lever available to improve PLNG's commercial performance
Potential Improvement Opportunities	4.1	**PLNG sales pipeline:** Identify the levers to accelerate the timeline to fill the PLNG sales pipeline
Potential Improvement Opportunities	4.2	**BOG management:** Verify that all stakeholders are aligned with the current BOG management plans and that those plans optimize efficiency
Potential Improvement Opportunities	4.3	**By-product commercialization:** Create a plan to commercialize by-products, if viable
Potential Improvement Opportunities	5.1	**Maintenance processes:** Refine key maintenance procedures (daily prioritized schedule, RCFA, Bad Actor program)
Potential Improvement Opportunities	5.2	**Continuous improvement program:** Develop a formal continuous improvement program
Potential Improvement Opportunities	5.3	**Turnaround strategy and management program:** Proactively identify turnaround drivers and establish a formal turnaround program
Potential Improvement Opportunities	6.1	**Procure to Pay processes:** Update Procure to Pay (PtP) processes to formalize steps that are currently people-dependent
Potential Improvement Opportunities	6.2	**Inventory management process:** Create a process to systematically determine if materials are over/under stocked

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What we found: Findings

High
Medium
Low

Findings were identified that are critical to address to safely and profitably operate Tacoma LNG

Finding[1]	Finding description	Suggested action plan	Risk	Complexity
1.1 While low initial plant utilization may reduce the risk from single points of failure, risks have not been assessed in rigor and steps taken may not sufficiently address the risks	The plant design creates numerous single points of failure. Risks have been identified, but they have not been categorized to distinguish high, medium and low risks. Some mitigation steps have been taken. Leading practice is to contingency plan for medium/high risks.	▪ Identify the risks associated with single points of failure and categorize them as high, medium and low ▪ Develop contingency plans for all medium and high risks	High	M
2.1 Although operational responsibilities are clear across PSE and PLNG, lack of defined economic responsibilities may hinder effective operations and maximizing profitability	Distinct products are produced by Tacoma LNG on behalf of PSE and PLNG, and the products are incorporated in separate financials. Leading practice involves establishing clear economic responsibilities, enabled by effective stewardship processes for business units and the overall entity.	▪ Define accountability for individual financials (PSE, PLNG) and overall Tacoma LNG ▪ Establish systematic stewardship processes, with clear responsibilities and targets	High	H
1.2 While regular ramp up/down of operations is expected and acknowledged to have negative impacts on equipment, minimal work has been conducted to assess and mitigate impacts	Operations leadership acknowledges the plant is not designed for cycling at that frequency and that it can have negative impacts. Mitigation steps focus on maximizing each individual cycle. The current plan is reactive; operate, see how/ where issues occur, and adjust accordingly.	▪ Engage with SMEs to identify impacts from frequent cycling ▪ Develop strategy and processes to measure and mitigate high and med risks ▪ Observe during operations and refine mitigation efforts	Medium	H

PUGET SOUND ENERGY

Notes: (1) Finding IDs refer to the ID assigned to each Operational Requirement checked in Sprint 2. See *Observation Detail by Operational Requirement* for further details on each requirement checked.

What we found: Optimization opportunities (1 of 2)

While deemed less critical to start-up than the findings, there are optimization opportunities that could enhance operations and improve asset value

Optimization opportunity[1]	Context	Impact	Complexity
4.1 Identify the levers to accelerate the timeline to fill the PLNG sales pipeline (e.g., compare PLNG strategy vs. analogs). Screen and implement viable levers.	▪ Selling out plant capacity has slipped from 2022 to 2027, driven by PLNG sales[2], which has focused on providing bunkering. Other levers may exist to increase sales.	H	H
2.2 Establish scorecards to systematically steward performance for NAES and Tacoma LNG that include KPIs and sub-KPIs across key business areas and drivers	▪ While a scorecard is planned to steward NAES' performance, a scorecard is also warranted for the Facility, with both using LNG-tailored KPIs	H	M
3.1 Increase the flexibility of gas purchases to make another lever available to improve PLNG's commercial performance	▪ The decision to purchase gas from PSE indexed to the first-of-the-month was made to limit risk and manage practical constraints. There may be an opportunity to revisit.	M	H
1.5 Utilize a volume-based, empirical approach to determine production potential for key operations (e.g., liquefaction and vaporization) and downtime	▪ Downtime identification and tracking plans are under development. Refinements are needed to initial plans to establish an effective downtime program.	M	H
5.1 Refine key maintenance procedures: develop weekly maintenance schedule that is prioritized daily; verify RCFA process is LNG-tailored; proactively identify Bad Actors.	▪ While there are plans to build processes for scheduling, RCFAs and Bad Actors, refinements are needed to achieve reliable and effective results	M	H
1.3 Revise the ramp up/down procedures to integrate actions to mitigate and measure risks categorized as high and medium impacts	▪ There is a detailed process in place to ramp up/down operations, though the actions to mitigate impact from regular cycling are not integrated	M	M
1.4 Perform RAM (reliability, availability, maintainability) analysis to create a baseline that the PSE Asset Manager can use to help steward NAES' work	▪ Although low initial plant utilization reduces risk of supply disruption, conducting a RAM analysis prior/near start-up may enable improved results	M	M
5.2 Develop a continuous improvement process that systematically assesses equipment performance and refines equipment strategies to optimize results	▪ Continuous improvement is viewed as a mind set that will be completed on an ad hoc basis, though a detailed and systematic process may enable improved results	M	M

PSE PUGET SOUND ENERGY

Notes: (1) Optimization opportunity IDs refer to the ID assigned to each Operational Requirement checked in Sprint 2. See *Observation Detail by Operational Requirement* for further details on each requirement checked;
(2) Finding IDs refer to the ID assigned to each Operational Requirement checked in Sprint 2.

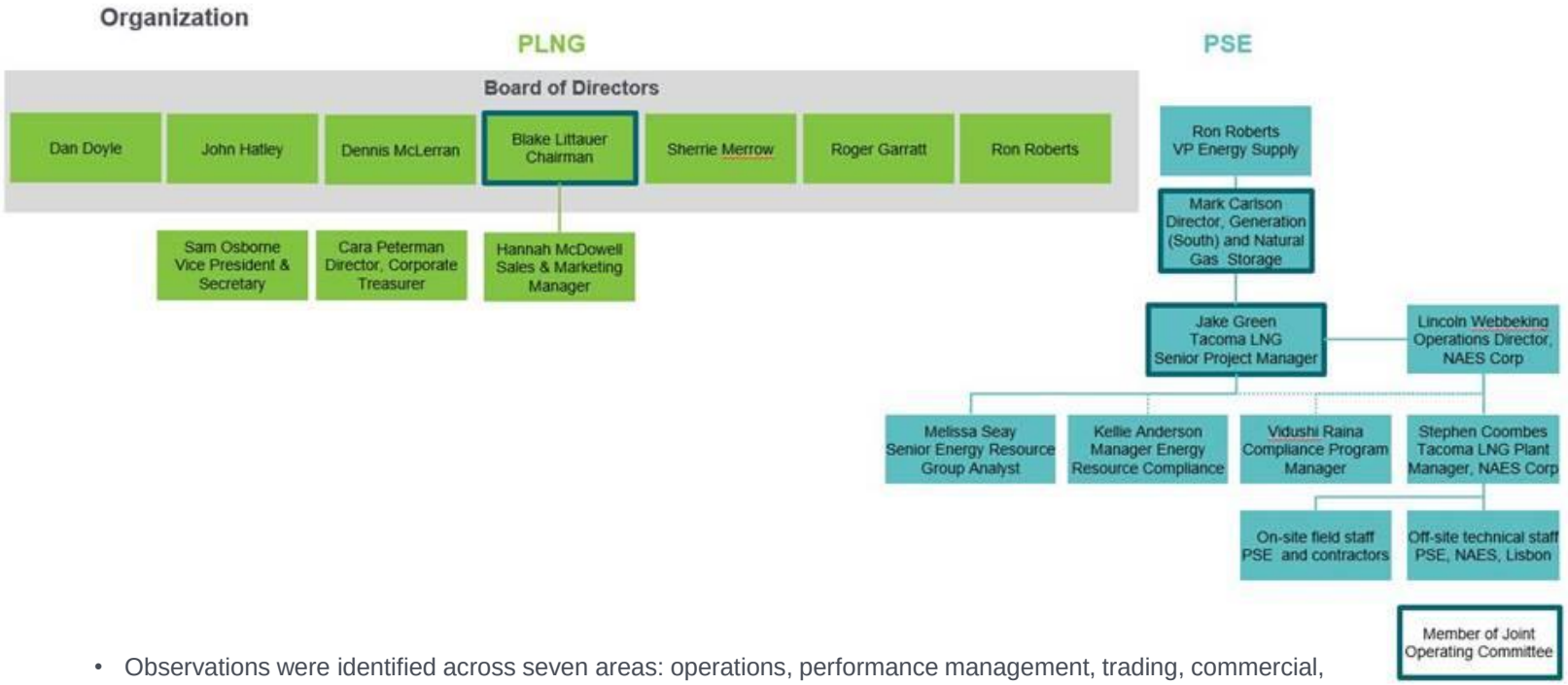
What we found: Optimization opportunities (2 of 2)

While deemed less critical to start-up than the findings, there are optimization opportunities that could enhance operations and improve asset value

Optimization opportunity	Context	Impact	Complexity
1.6 Verify the planned operations technology is integrated into processes and training; implement Real Time Optimization (RTO) technology to enhance plant efficiency	▪ There are detailed procedures to operate the plant, though integrating technology to automate optimizing plant operating parameters may improve plant performance	M	L
6.2 Create a process to systematically determine is materials are over/under stocked; add features to automatically notify NAES if critical materials are understocked.	▪ NAES will manage inventory, but there is not a detailed process. Inventory levels will be reviewed ad hoc, which may cause operational delays due to inventory shortages.	M	L
4.2 Verify that all stakeholders are aligned with the current BOG management plans and that those plans optimize efficiency	▪ BOG generated while the plant is not operating is expected to be sent to the domestic gas system, though it is not clear if the quality (i.e., heating value) of the BOG will be acceptable to system engineers. BOG generated while the plant is operating is to be recycled through the plant, though it is not known how that will impact plant efficiency.	L	M
5.3 Proactively identify the scenarios (e.g., flare tip replacement) requiring a turnaround, and establish a turnaround program a minimum of two years in advance	▪ A turnaround program is planned but not yet developed. Leadership anticipates a turnaround every ten years. However, other LNG turnarounds have been more frequent.	L	M
4.3 Determine the amount of by-products anticipated and potential margin if they are sold. Create a plan to handle by-products based on assessment results.	▪ Minimal by-products are expected. Current plans entail providing by-products to nearby entities at no cost, though there may be profits available by selling them.	L	M
6.1 Update Procure to Pay (PtP) processes to memorialize steps in which people-dependent leading practices are not documented	▪ PtP processes are established and incorporate some industry leading practices, but some processes rely on people-dependent ways of working that are undocumented	L	L

Actioning the observations

A key next step is socializing and aligning on the plan to address the Observations



- Observations were identified across seven areas: operations, performance management, trading, commercial, maintenance, materials management, operating model

Detailed Observations by Operational Requirement

PUGET SOUND ENERGY

Operations: Single point failure risk mitigation

	Requirement checked	Status	Observation summary	Owner
1.1	Single point failures are identified, and plans are established to mitigate risks	Finding	Although low initial plant utilization may reduce the risk from single points of failure, contingency planning may be necessary for some risks.	Asset Manager: *Jake Green*

Observations

The plant design creates numerous single points of failure	Jake Green
Risks associated with the single points of failure have been identified, but they have not been documented or categorized to distinguish high, medium and low risks	Jake Green
Actions have been taken to mitigate some of the single points of failure with higher risks, such as purchasing critical spares and identifying the vendors to make repairs	NAES
There is low risk of causing supply disruptions to customers given the low initial plant utilization and the measures established to mitigate select single points of failure	Jake Green
A risk assessment and corresponding contingency plans have not been observed for single point failures	Documents provided

Industry leading practice

- Single point failures are identified and categorized by risk, reduced to the extent prudent, and plans are established to mitigate risks, with contingencies established when the risk level warrants

Potential improvements/actions

1. Identify the risks associated with the single points of failure and categorize them as low, medium and high
2. Develop contingency plans (e.g., update sparing strategy) for all medium and high risks

Case for action

- **SSHE**: Safety, security, healthy and environment - increase system integrity and reduce extent of environmental risks with single points of failure
- **Costs**: avoid equipment/delivery costs if replacement materials require expediting
- **Reliability**: increase system integrity

Implementation complexity/effort

Low 1 2 3 **4** 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
High effort to engage SMEs and develop crash plans	Moderate effort to revise processes to address single points of failure	Moderate additional technology/data may be required

PUGET SOUND ENERGY

Operations: Ramp up/down impact mitigation

	Requirement checked	Status	Observation summary	Owner
1.2	Impacts of regular ramp up/down considered prior to operations and mitigation plans developed	Finding	While regular ramp up/down is expected to have negative impacts on equipment, minimal work has been conducted to mitigate potential risks.	Asset Manager: *Jake Green*

Observations

The plant is planning for frequent ramping up and down, and there are detailed processes in place to start up and shut down the plant	Jake Green
There is acknowledgement by the day-to-day operator that there will be frequent ramping (up/down) of the operations	NAES
Frequent plant cycling can have negative impacts, and the engineering, procurement, and construction contractor (EPC) is not designing a plant to cycle at that frequency	Jake Green
To mitigate impacts, the plan is to ensure each cycle: (a) is as long as possible, and (b) ramps at rates compliant with original equipment manufacturer (OEM) recommendations	NAES
No work has been done to date to see how or which key equipment will be impacted from the current cycling plan	Jake Green
The current plan is reactive (i.e. not proactive); operate, see where/how the issues occur, and adjust the operations and maintenance strategies accordingly	Jake Green

Industry leading practice

- Potential impacts of ramp up/down are proactively identified and evaluated, categorized according to risk, mitigated through procedures, and measured during operations to continuously improve performance

Potential improvements/actions

1. Engage with SMEs (e.g. OEMs) to identify impacts from frequent cycling prior to beginning operations
2. Develop strategy and processes to measure and mitigate risks categorized as high and medium
3. Observe key areas during ramp up/down and continuously refine mitigation efforts

Case for action

- **Cost**: reduce maintenance, unit operating costs, and extend equipment lifecycle
- **Environmental**: increase system integrity and decrease unintended impacts (e.g., flaring)

Implementation complexity/effort

Low 1 2 3 **4** 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
High extent of SME engagement (e.g., OEMs) to identify and mitigate impacts	High potential strategy/process change to address cycling impacts	Moderate effort to assess unique impacts for current cycling approach

PUGET SOUND ENERGY

Operations: Ramp up/down process

	Requirement checked	Status	Observation summary	Owner
1.3	Ramp up/down process established to safely and cost effective start-up and shut-down operations	No finding; Optimization opportunity	There is a detailed process in place to ramp up/down operations, though actions to mitigate impact from regular cycling are not integrated.	Asset Manager: *Jake Green*

Observations

Detailed and generic procedures have been drafted to start up and shutdown the plant	Jake Green
Plant Operations Leadership is familiar with the process to start up, operate and shutdown the plant	NAES
A training program is planned to ensure the day-to-day operator personnel responsible for start up and shutdown of the plant have adequate training to safely and effectively perform their tasks	NAES
Operations metrics for safety, maintenance, and reliability are planned for inclusion in the Operator scorecard	Jake Green

Industry leading practice

- Develop procedure to ramp up/down operations that addresses SSHE, streamlines costs, and optimizes equipment impact, given the planned operational approach

Potential improvements/actions

1. Engage with SMEs (e.g., OEMs) to identify impacts from regular ramp up/down prior to beginning operations
2. Revise start up and shut down procedures to integrate actions to mitigate and measure risks categorized as high and medium impacts

Case for action

- **Cost**: reduce maintenance and extend equipment lifecycle
- **Environmental**: increase system integrity and decrease unintended impacts (e.g., flaring)

Implementation complexity/effort

Low 1 **2** 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Expertise outside of PSE/NAES (e.g., OEMs) may be required	Moderate potential procedure change to integrate mitigation actions	Moderate effort to assess unique impacts for current cycling approach

PUGET SOUND ENERGY

Operations: RAM analysis

	Requirement checked	Status	Observation summary	Owner
1.4	RAM (reliability, availability, maintainability) analysis is conducted and used to inform the maintenance strategy	No finding; Optimization opportunity	Although low initial plant utilization reduces risk of supply disruption, conducting a RAM analysis before/near startup may enable improved results.	Asset Manager: *Jake Green*

Observations

Risk of plant upsets resulting in the inability to supply customer demand is low during initial operations due to: • relatively low plant utilization • ability to utilize inventory on-hand • time to repair equipment prior to impacting schedule	Jake Green
The low initial risk will allow developing a view of reliability, availability, and key maintenance requirements post-commissioning	Jake Green
There is recognition of the benefit from conducting a RAM analysis, and the plan is for NAES to conduct analysis in Q3 2021 after operations begin, which is anticipated for Q2 2021	Jake Green

Industry leading practice

- Perform RAM analysis and establish key targets for reliability/availability and maintenance focus areas prior to operations
- Leverage the targets and focus areas to drive effective, reliable performance

Potential improvements/actions

1. Identify critical maintenance focus areas and requirements prior to commencing operations
2. Given low initial plant utilization, conduct RAM (or similar) within first quarter of operations to establish potential reliability and achievability
3. Utilize reliability and availability metrics in scorecards to drive performance

Case for action

- **Cost:** enable lower unit costs by predicting potential maintenance issues and enhancing strategies to reduce opex
- **Commercial**: improve reliability/availability and reduce risk of supply disruptions

Implementation complexity/effort

Low 1 2 **3** 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate expertise may be required outside of PSE/ NAES	Minimal process change to refine maintenance strategies	Data to represent planned regular cycling approach may be limited

PUGET SOUND ENERGY

Operations: Identifying and tracking downtime

	Requirement checked	Status	Observation summary	Owner
1.5	Production target setting process and downtime reporting process are established	No finding; Optimization opportunity	Downtime identification/tracking plans are under development. Refinements are needed to initial plans to establish an effective downtime program.	Asset Manager: *Jake Green*

Observations

The approach to identify and steward downtime is currently being developed	Jake Green
The initial approach to determine downtime is based on the number of days that production was planned	Jake Green
Once the approaches are developed, the metrics will be tracked and steward in the NAES scorecard	Jake Green
The tool planned to track downtime is Maximo	Jake Green

Potential improvements/actions

1. Determine downtime related to key operations, including liquefaction and vaporization
2. Utilize a volume-based, empirical approach to determine production potential and downtime (e.g., best demonstrated rate[1])
3. Track downtime at the equipment tag level and where it is caused

Case for action

- **Operations**: improve reliability and volumes hindered by latent maintenance issues
- **Commercial:** reduce the risk of supply disruptions from lagging reliability performance

Industry leading practice

- Production downtime is identified using an empirical, volume-based, and non-subjective view of downtime
- Cause and impact of downtime are explicitly tracked, down to the equipment tag level
- A holistic, empirical system is used to identify and quantify downtime

Implementation complexity/effort

Low 1 2 3 **4** 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
High effort to engage SMEs and upskill staff to implement program	Moderate effort may be needed to build downtime program	Moderate additional data and tech may be required to track and implement

PUGET SOUND ENERGY

Notes: (1) Best demonstrated rate is a mathematical measure to identify what production should have been, assuming the operations were able to achieve and maintenance historic production levels

Operations: Operating procedures and system

	Requirement checked	Status	Observation summary	Owner
1.6	Effective operating procedures are documented and understood by the operator	No finding; Optimization opportunity	There are detailed procedures to operate the plant, though verifying/considering automation technology may enable improving performance.	Asset Manager: *Jake Green*

Observations

There are detailed procedures in place to operate the plant, and the day-to-day Operations leadership is familiar with the procedures	Jake Green, NAES
There are plans to on-board and train the day-to-day operators to ensure they can effectively operate the plant	NAES
Plant operating parameters will initially follow set points established by the EPC	Jake Green
There are no automated triggers (e.g., RTO) to optimize set points; plant performance will be tracked and manually adjusted to improve results.	Jake Green
The technology placemat shows “DCS/RTO” for plant operations to be installed by the EPC, indicating there may be plans to install technology to automate plant operations	Technology placement

Industry leading practice

- Effective operating procedures are developed and understood by the operator
- A control system is leveraged to automatically change plant operating parameters (e.g., pressures, flow rates) to optimize plant performance (e.g., yield, throughput)

Potential improvements/actions

1. Verify the plant operations technology (i.e., control system) that will be utilized to operate the plant
2. Validate the planned technology is integrated into the related operating processes under development
3. Evaluate business case of utilizing RTO technology to improve plant performance (if RTO is not already planned)

Case for action

- **Profitability**: expand throughput/volumes, increasing revenues once open capacity is sold
- **Costs**: minimize energy consumption and corresponding costs

Implementation complexity/effort

Low 1 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate effort to engage SMEs outside NAES and train personnel	Minimal incremental effort may be needed to build processes	None identified (assumes RTO planned)

PUGET SOUND ENERGY

Operations: Air Permit Compliance

	Requirement checked	Status	Observation summary	Owner
1.7	Processes are in place to effectively manage compliance with air permitting (e.g., flaring)	No finding	The Air Permit has stipulations for gas sourcing and operations. Multiple procedures/process are under development to ensure compliance.	Envr. Mgr: *TBD* Asset Manager: *Jake Green*

Observations

The Air Permit has stipulations regarding natural gas sourcing and operations (including vaporization, flaring, leak detection and monitoring)	Jonathan Harris
Compliance requirements are summarized in the LNG Permit Operating Compliance Summary	Jake Green
There are responsibilities for the plant to monitor and other responsibilities for PSE corporate; PSE environmental is ultimately responsible.	Jake Green
There are multiple procedures/processes relating to compliance, and they are under development	Charles Seese

Industry leading practice

- Procedures and responsibilities to address requirements in the air permit are developed, executed and tracked to ensure compliance

Potential improvements/actions

1. Identify the procedures/processes relating to Air Permit Compliance and the interdependencies, and ensure the compliance requirements are comprehensively and consistently addressed

Verify in a follow-up phase

Case for action

- **Environmental**: reduce compliance events and increase system integrity
- **Costs/commercial**: reduce costs and penalties from compliance events

Implementation complexity/effort

Low **1** 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate effort to train/upskill staff	Minimal incremental effort may be needed to build processes	Minimal additional technology may be required

PUGET SOUND ENERGY

Operations: PI Historian

	Requirement checked	Status	Observation summary	Owner
1.8	Installed components are mapped to the PI Historian system	No finding	Components are being integrated into PI and checked as they are installed. The installation, integration, and verification are on-going.	Asset Manager: *Jake Green*

Observations

Components are being integrated into the PI system at the same time they are installed	Jake Green
Verification of installed components is concurrently being completed during integration to ensure the components are functioning properly and measuring accurately	Jake Green
The day-to-day operator confirms the PI integration activities and the process in place to identify any potential mis-mappings	NAES
The installation, integration and verification of components into PI is not complete, but is on track	Jake Green

Industry leading practice

- Installed components are integrated into the PI system, and the system is checked prior to operations for completeness and accuracy

Potential improvements/actions

1. Verify status in a later phase

Case for action

- **SSHE:** decrease unintended safety events from lack of complete and correct process measurement data
- **Operations/commercial:** increase reliability/ integrity of operations and reduce potential supply disruptions through reliable and correct process data

Implementation complexity/effort

Low **1** 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
None identified	None identified	None identified

PUGET SOUND ENERGY

Operations: Gas purchase, allocation, and validation

	Requirement checked	Status	Observation summary	Owner
1.9	Gas purchase, allocation and validation procedures are in-place	No finding	Scheduled gas is purchased, accumulated in a PLNG "imbalance account" that is offset by PSE use, and validated through inventory tracking.	Commercial Mgr: *Bill Donahue*

Observations

The schedule of gas needed for PSE and PLNG is developed proactively and provided to PSE traders to purchase at the beginning of each month	Bill Donahue
Gas purchased for PLNG accumulates in an "imbalance account" over the month, decreasing as liquefaction occurs	Bill Donahue
PLNG's portion of BOG consumed as fuel gas is applied as a credit to PLNG's "imbalance account"	Bill Donahue
Gas costs charged to PLNG are based on gas used during the month and reflect the gas cost plus service fees	Bill Donahue
If less gas is required, gas remains in inventory, and future gas purchases are adjusted based on inventory levels and projected need for PSE and PLNG	Bill Donahue
Air Permit requires purchasing gas from British Columbia, and a process is in place to ensure this is met	Bill Donahue

Potential improvements/actions

No finding. Complete.

Case for action

N/A

Industry leading practice

Develop procedure to:

- proactively identify needs for gas purchase
- allocate to the respective parties
- validate the correct amount was purchased and revise inventory

Implementation complexity/effort

Low 1 2 3 4 5 High

Level of capability & skill change	Governance & process change	Availability of data & technology
N/A	N/A	N/A

PUGET SOUND ENERGY

Operations: HAZOP

	Requirement checked	Status	Observation summary	Owner
1.10	Hazard and operability study (HAZOP) completed and plans established to address risks (e.g., production nears tank tops)	No finding	HAZOP complete, and all mitigation measures are signed off, except TOTE approval of stakeholder interfaces regarding bunkering	Asset Manager: *Jake Green*

Observations

HAZOP study completed. Risks have been identified and mitigated, and the report is developed.	Jake Green
All mitigation measures are approved, except TOTE and Coast Guard approval for bunkering interfaces among CB&I (Chicago Bridge & Iron), TOTE and PSE	Jake Green
Discussions are actively progressing to secure approvals	Jake Green

Potential improvements/actions

1. Secure approval from all parties regarding bunkering interfaces between CB&I, TOTE and PSE

Case for action

- **SSHE**: decrease unintended impacts (e.g., spill) during mooring and loading
- **Commercial**: reduce delays due to lack of coordination when arriving, loading and departing

Industry leading practice

- Conduct HAZOP, develop plans/procedures to address risks identified across operating regimes, and receive sign-off from key stakeholders

Implementation complexity/effort

Low **1** 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
None identified	Minimal (if any) changes to secure TOTE approval	None identified

PUGET SOUND ENERGY

Performance management: Economic accountability

	Requirement checked	Status	Observation summary	Owner
2.1	Clear accountability and stewardship responsibilities for individual business units and overall entities are established	Finding	Although operational responsibilities are clear across PSE and PLNG, lack of defined responsibilities may limit maximizing profitability.	Puget Energy: *TBD*[1]

Observations

Distinct products are provided for PLNG and PSE as part of Tacoma LNG. PLNG and PSE products are incorporated in separate P&Ls and both roll up to Puget Energy.	Bill Donahue
While operational responsibilities are understood, accountability to steward the P&Ls and maximize results for PLNG, PSE, and Puget Energy are unclear	Blake Littauer Jake Green Bill Donahue
Achieving revenue related objectives for PLNG are the PLNG Director's responsibility. Costs are considered pass through P&L results are not within the Director's mandate.	Blake Littauer
The Tacoma LNG Asset Manager is responsible (on behalf of PSE and PLNG) for all plant and bunkering operations activities and costs, but has no revenue responsibilities	Jake Green
PSE's portion of the plant does not have a P&L, but will be interested in optimizing the cost structure. The PLNG portion of the plant will have a full P&L.	Bill Donahue

Industry leading practice

- P&L accountability and stewardship for individual business units and the overall entity are effective, with defined processes, targets and responsibilities

Potential improvements/actions

1. Define accountability for the performance of the relevant entities: cost performance of the plant on behalf of PSE and P&L performance of PLNG
2. Establish systematic stewardship processes, with clear responsibilities and targets

Case for action

- **Profitability**: enable maximizing profits across PSE and PLNG
- **Sales**: widen aperture of sales opportunities given focus on sales that meet margin requirements

Implementation complexity/effort

Low 1 2 3 **4** 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate to high potential as additional hiring may be required	High effort to create alignment across PSE/PLNG and create processes	Minimal additional technology may be required

PUGET SOUND ENERGY

Notes: (1) Direction regarding economic accountability and performance (e.g., required asset or facility returns, allocation of resources and effort to achieve relative to overall entity valuation) needs to come from the highest levels of leadership. An owner will be assigned for MAP purposes, to set forth clear expectations for both PSE and PLNG management teams.

Performance management: Tacoma LNG and NAES scorecards

	Requirement checked	Status	Observation summary	Owner
2.2	Performance scorecards are developed for the Facility and NAES	No finding; Optimization opportunity	While a scorecard is planned to steward NAES' performance, a scorecard is also warranted for Tacoma LNG, with both using LNG-tailored KPIs.	Asset Manager: *Jake Green*

Observations

The Facility operations and related costs will be managed by a PSE Asset Manager, and day-to-day O&M activities will be subcontracted to a third party NAES	Jake Green
NAES' performance will be stewarded in a monthly scorecard, which is being created and planned to include KPIs to ensure safe, reliable and cost effective operations	Jake Green
To drive NAES' performance results, both lagging (e.g., downtime) and leading (e.g., MTBR) KPIs are warranted	Jake Green
Asset Manager acknowledges there is a need for two scorecards: (1) detailed scorecard to steward NAES' performance, and (2) higher level scorecard to steward the Facility performance	Jake Green
Development of the scorecard and process to steward the Facility performance has not begun	Jake Green

Industry leading practice

- Performance is systematically stewarded by scorecards with KPIs and sub-KPIs that set targets to measure performance across the key business areas and underpinning drivers

Potential improvements/actions

1. Verify the NAES scorecard includes the KPIs and sub-KPIs tailored to effectively steward LNG performance
2. Create a higher level scorecard for Tacoma LNG performance that covers the key business areas
3. Ensure processes are in place to efficiently collect the data needed for the scorecards

Case for action

- **Cost**: enable highlighting cost/issue drivers and reduce/avoid costs
- **Reliability/commercial**: enable improving system integrity, increasing uptime, reducing supply risks
- **SSHE**: enable improving safety and environmental

Implementation complexity/effort

Low 1 **2** 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate effort to engage SMEs outside of PSE for KPIs insights	Minimal effort to refine scorecard stewardship processes	Minimal additional technology/data may be required

PUGET SOUND ENERGY

Trading: Gas trading procedures

	Requirement checked	Status	Observation summary	Owner
3.1	The optimization of PSE and PLNG trading procedures to effectively manage profitable performance, risk and operational needs	No finding; Optimization opportunity	Purchasing gas indexed to first-of-the-month was made to for good reason(1), but there may be an opportunity to revisit to provide more flexibility.	PLNG Director: *Blake Littauer*

Observations

The same PSE gas traders purchase gas for PSE and PLNG; a different purchasing option may require significant changes, including but not limited to investment in infrastructure access, permitting and price risk	Bill Donahue
PSE gas traders will also be used to determine when gas is needed for peak shaving and will inform the Asset Manager	LNG Facility JOM
Two measures are planned to mitigate suboptimal impact on PLNG gas prices: (a) securing PLNG gas price based on third party quote, and (b) purchasing PLNG gas at the beginning of the month for the month's projected production	Bill Donahue
The inability for PLNG to purchase gas throughout the month is recognized as limiting the opportunity to exploit market price swings and potentially secure lower gas prices	Bill Donahue

Industry leading practice

- Traders are incentivized and have the requisite capabilities to maximize the benefits for the entities they represent
- Traders purchase gas exclusively on behalf of the entities they represent and do not have conflicts of interest with gas suppliers
- Traders retain the optionality for the time, size, source and method (e.g., spot order) of purchases to enable optimizing costs incurred
- Multiple sources of gas supply are identified and engaged to offset risk from potential supply disruptions

Potential improvements/actions

1. Provide flexibility for PLNG to purchase gas on multiple indexes (e.g., daily spot, first-of-the-month)
2. Ensure PLNG has the requisite training and tools to optimize gas purchases and sales to increase margin

Case for action

- **Cost:** unlock potential for PLNG to secure optimal gas prices
- **Controls:** reduce risk (actual and perceived) of traders sub-optimally impacting PLNG gas prices

Implementation complexity/effort

Low 1 2 3 4 **5** *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
High potential for change to upskill traders and potentially hire role	High process change is required to split traders and open purchase options	Moderate tech change to provide PLNG traders with required tools

PUGET SOUND ENERGY

Notes: (1) We understand that in 2019 knowledgeable, experienced members of the Management team conducted an analysis over three potential gas procurement options considering factors including but not limited to cost, feasibility of physical delivery, permit restrictions, staffing optimization, and compliance monitoring. This analysis resulted in selection of the structure described on this slide. The Management team expressed that pursuit of a different option would be challenging, with significant doubt as to potential for increased profitability.

Commercial: Accelerating PLNG sales pipeline

	Requirement checked	Status	Observation summary	Owner
4.1	PLNG sales pipeline and production ramp up are accelerated to the extent feasible to improve asset value	No finding; Optimization opportunity	Selling out plant capacity has slipped from the plan of 2022 to 2027. Asset value is reduced to -[redacted] and levers may exist to increase NPV.	PLNG Director: *Blake Littauer*

Observations

Initial PLNG plans assumed 75% of capacity would be sold the first year of start-up (2021), hitting 100% each year after	CEO deck Sep. '19
Multiple events resulted in current sold capacity of 19% in 2021, increasing to 51% by 2023, and reaching 100% by 2027. Deceleration in the uptake of the sales pipeline results in a Tacoma LNG NPV [redacted]	CEO deck Sep. '19; LNG financial model
Common industry IRRs are ~8%, requiring a NPV of $49M	LNG model
The primary plan to fill the sales pipeline is to provide bunkering to cruise and shipping lines, with minor LNG for trucking	Blake Littauer, sales pipeline
The PLNG Director is the sole staff driving sales uptake	Bill Littauer
Other potential levers (e.g., milk runs to nearby LNG customers, bring on more sales staff) may exist to accelerate the uptake of sales and increase NPV	Bill Littauer

Industry leading practice

- The timeline to produce at the maximum operable limit of the plant is shortened to the extent prudent to optimize asset value
- Multiple potential levers exist to reduce the timeline, such as seeking alternative sales channels and bringing on additional sales staff

Potential improvements/actions

1. Accelerate the timeline to sell out PLNG open capacity (i.e., fill sales pipeline) by:
   a. Comparing PLNG's sales strategy versus industry leading strategies for analog LNG plants
   b. Assessing feasibility of leading tactics (e.g., upsize sales staff, accelerate construction)
2. Screen, select and implement the viable levers

Case for action

- **Profitability**: enable accelerating sales, covering fixed costs, and increasing asset value
- **Commercial**: broaden customer base and reduce exposure to customer bankruptcy

Implementation complexity/effort

Low 1 2 3 **4** 5 High

Level of capability & skill change	Governance & process change	Availability of data & technology
High effort to bring on SMEs to investigate levers to bolster LNG uptake	Moderate effort to revise processes to integrate levers actioned	Moderate data and tech changes to explore and integrate levers actioned

PUGET SOUND ENERGY

Commercial: BOG management

	Requirement checked	Status	Observation summary	Owner
4.2	Procedures defined for how BOG (vessel, plant) will be managed (e.g., reprocessed in plant, flared) are established	No finding; Optimization opportunity	BOG management procedures have not been developed. Plans involve recycling BOG in the plant when possible, though it may be suboptimal.	Asset Manager: *Jake Green*

Observations

BOG will be created and captured when operating the plant and loading LNG onto the ships, and how it is handled depends on if the plant is operating	Bill Donahue
Procedures for handling BOG have not yet been developed. In general, the goal is to use BOG where possible.	NAES
If the plant is operating, BOG will be recycled to the inlet of the liquefaction train at the plant	NAES
If the plant is not operating, the options to handle BOG are to flare or inject it into the PSE gas system; the current plan is to inject into the PSE gas system.	Bill Donahue
The requirements and approval to inject BOG into the PSE gas system are unclear	Bill Donahue

Potential improvements/actions

1. Verify if recycling BOG through the plant results in suboptimal plant yield
2. Evaluate the pros/cons from handling BOG from loading ships differently than BOG from the plant
3. Ensure plans are understood and accepted at necessary levels of leadership

Verify in a follow-up phase

Case for action

- **Profitability**: improve plant efficiency and yield from liquefaction (i.e., BTU content)
- **Sales**: potential to commercialize BOG

Industry leading practice

- Outline procedures for how BOG will be captured and managed such that requirements are met, plant performance is optimized, and commercial opportunities are exploited (where possible)

Implementation complexity/effort

Low 1 2 **3** 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate effort to engage SMEs outside of PSE for technical insights	Moderate effort to revise processes to refine use of BOG	Minimal additional technology/data may be required

PUGET SOUND ENERGY

Commercial: By-product management

	Requirement checked	Status	Observation summary	Owner
4.3	Plan for addressing by-products (e.g., CNG) is developed	No finding; Optimization opportunity	Although minimal by-products are expected, assessing commerciality may reveal there are opportunities to sell them and increase profits.	PLNG Director: *Blake Littauer*

Observations

Minimal by-products are expected to be generated during plant operations based on stakeholders' experience with other LNG operations	Blake Littauer
Given the small amount generated, by-products will be handled on an ad hoc basis	Blake Littauer
Although there are local chemical companies nearby, by-products are not planned to be commercialized due to the low volumes and initial plans to batch LNG production	Blake Littauer

Potential improvements/actions

1. Conduct a high level assessment to identify the amount of by-products and potential margin if they are sold to potential customers
2. Create a plan to handle by-products, given the results from the high level assessment

Case for action

- **Profitability**: potential improve PLNG profits
- **Commercial/sales**: potential to extend customer relationships

Industry leading practice

- Plans are developed for optimizing the commerciality of by-products, including identifying the extent of by-products generated, securing customer contracts/sales, and minimizing cost of supply

Implementation complexity/effort

Low 1 2 **3** 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate effort to assess margin and manage by-products	Moderate effort to create and execute plan to handle by-products	Minimal additional technology/data may be required

PUGET SOUND ENERGY

Maintenance: Creating scheduling, RCFA, and Bad Actor processes

	Requirement checked	Status	Observation summary	Owner
5.1	The following maintenance processes are defined: risk-based work selection, data collection, RCFAs and Bad Actors.	No finding; Optimization opportunity	While there are plans to build processes for scheduling, RCFAs, and Bad Actors, refinements are needed to achieve reliable and effective results.	Asset Manager: *Jake Green*

Observations

NAES is developing processes for maintenance scheduling, RCFAs and Bad Actors	Jake Green
Maintenance scheduling will be dynamic and will be reviewed and prioritized each day (as opposed to setting a weekly schedule on breaking-in by exception)	NAES
There is a process for RCFAs for production and environmental related events. NAES brought in standard procedures and a consulting firm is engaged to ensure the procedures are tailored to LNG operations.	Jake Green
There is a plan to assess Bad Actors, and failures and costs will be tracked and used to identify them. There are not set flags or timing to identify Bad Actors.	Jake Green

Industry leading practice

- **Maintenance schedule**: high-level schedules are built yearly to mitigate supply disruptions and synergize work; detailed schedules are created weekly to streamline activities; and, work is prioritized daily given risks.
- **RCFAs**: lessons from loss incidents are identified, investigated and integrated back into processes timely
- **Bad actors**: KPIs tracked and reviewed systematically to identify issues

Potential improvements/actions

1. Develop weekly maintenance schedule to streamline activities. Prioritize the schedule daily with a structured prioritization process (e.g., RBWS (risk based work selection)).
2. Validate RCFA procedures are tailored to LNG ops
3. Proactively identify potential Bad Actors by identifying KPIs (e.g., downtime by equipment tag) and systematically tracking them (e.g., scorecard)

Case for action

- **Cost:** unlock potential for PLNG to secure lower gas prices
- **Controls:** reduce risk (actual and perceived) of PSE traders sub-optimally impacting PLNG gas prices

Implementation complexity/effort

Low 1 2 3 4 **5** High

Level of capability & skill change	Governance & process change	Availability of data & technology
High effort to engage SMEs outside of PSE and train personnel	High effort may be needed to refine/ build new processes	Moderate additional data and tech may be required to track and implement

PUGET SOUND ENERGY

Maintenance: Continuous improvement program

	Requirement checked	Status	Observation summary	Owner
5.2	Maintenance continuous improvement program established	No finding; Optimization opportunity	Continuous improvement is a mind set and will be completed on an ad hoc basis, though a defined process may enable improved results.	Asset Manager: *Jake Green*

Observations

There is not a continuous improvement program per se. Continuous improvement will be a mindset that the NAES team will be tasked with delivering and it will be a KPI for the NAES' contract.	Jake Green
Maintenance strategies will be assessed and modified over time based on observations that arise during operations	NAES
For example, the initial timing for a Project Manager may be quarterly, but it may be able to be extended to annual after monitoring it for a couple of years	NAES

Potential improvements/actions

1. Develop a continuous improvement process that systematically assesses equipment performance and refines equipment strategies to optimize results

Case for action

- **Cost:** reduce maintenance costs
- **Operations/commercial:** increase reliability/ integrity of operations

Industry leading practice

- Create a process to continually assess equipment performance and refine equipment strategies to optimize performance (e.g., cost, downtime)

Implementation complexity/effort

Low 1 **2** 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate effort to engage SMEs outside of PSE and train personnel	Minimal effort may be needed to build process	None identified

PUGET SOUND ENERGY

Maintenance: Turnaround strategy and program

	Requirement checked	Status	Observation summary	Owner
5.3	Turnaround strategy and management program developed	No finding; Optimization opportunity	A turnaround program is planned but not yet developed. A turnaround is anticipated every ten years, and it will be developed closer to that time.	Asset Manager: *Jake Green*

Observations

A turnaround program has not yet been developed. The team has been focused on items critical to start-up operations, and the first turnaround is not anticipated for ten years.	Jake Green
Although not confirmed, the suspect drivers for turnarounds will be vessel inspections and/or complete plant inspections	Jake Green
Five year budgets are developed, and this process could trigger the team to proactively identify the need for a turnaround and plan accordingly	Jake Green

Industry leading practice

- Develop an end-to-end turnaround strategy and management program that establishes processes, critical dates (e.g., scope freeze dates), responsibilities, tools, and team capabilities to minimize duration and spend

Potential improvements/actions

1. Identify the scenarios (e.g., flare tip replacement, vessel inspection) potentially requiring a turnaround
2. Determine the turnaround timing for each scenario
3. Establish the turnaround program a minimum of two years prior to the first turnaround. Best practices involve beginning planning two years out and locking scopes 12 to 18 months out.

Case for action

- **Cost:** decrease costs from running over turnaround schedule
- **Operations/commercial:** reduce the risk of supply disruptions from schedule overrun and production losses from ineffective ramp down/up processes

Implementation complexity/effort

Low 1 **2** 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Moderate effort to engage SMEs outside of PSE for LNG turnarounds	Moderate effort may be needed to build process	None identified

PUGET SOUND ENERGY

Maintenance: Maintenance management system

	Requirement checked	Status	Observation summary	Owner
5.4	Maintenance management system (MMS) is established and populated with installed components	No finding	Maximo will be the MMS and populated with installed equipment. NAES has uploaded the master data and is now uploading detailed data.	Asset Manager: *Jake Green*

Observations

Maximo will be used as the MMS and NAES will populate it with installed components	Jake Green
The master data for equipment has been loaded into Maximo	NAES
Detailed information is currently being uploaded for the equipment, focusing first on spares inventory and preventative work orders	NAES

Potential improvements/actions

1. Define the equipment information that is required to be uploaded into Maximo, and use this is a final checklist prior to start-up

Verify status in follow-up phase

Case for action

- **SSHE:** increase system integrity and decrease unintended maintenance impacts
- **Cost**: effectively steward maintenance requirements and minimize avoidable maintenance costs

Industry leading practice

- A digital system is used to store equipment and strategies, notify users of work required, document work performed, and conduct analytics

Implementation complexity/effort

Low 1 2 3 4 5 High

Level of capability & skill change	Governance & process change	Availability of data & technology
Minimal effort to build list of required attributes to load into Maximo	None identified	None identified

PUGET SOUND ENERGY

Maintenance: Equipment strategies

	Requirement checked	Status	Observation summary	Owner
5.5	Equipment maintenance strategies are developed and incorporated into the MMS	No finding	Maintenance strategies will be based on vendor recommendations and SME experience. Strategies are not built but will be prior to startup.	Asset Manager: *Jake Green*

Observations

Maintenance strategies will be based on OEM recommendations	Jake Green
Maintenance strategies include scheduled preventative maintenance, corrective maintenance procedures, and metrics to assess equipment performance	NAES
Development and input of the strategies has not begun, but they will be completed and integrated into the MMS prior to start-up	NAES
An equipment/asset list will be used to track developing the strategies and integrating them into the MMS	NAES

Industry leading practice

Equipment maintenance strategies are developed, integrated into the MMS, and include:

- failure mechanisms and risks
- preventative and corrective maintenance plans
- performance metrics to collect and assess

Potential improvements/actions

1. Identify the critical system components, develop maintenance strategies, and input into the MMS (Maximo)

Verify status in follow-up phase

Case for action

- **SSHE:** increase system integrity and decrease unintended maintenance impacts
- **Cost**: reduce maintenance costs and extend equipment lifecycle

Implementation complexity/effort

Low 1 2 3 4 5 High

Level of capability & skill change	Governance & process change	Availability of data & technology
Minimal effort to build list of required items for equipment strategies	None identified	None identified

PUGET SOUND ENERGY

Maintenance: Alarm management, permitting and lock-out/tag-out processes

	Requirement checked	Status	Observation summary	Owner
5.6	The following maintenance processes are defined: alarm management, permitting and lock-out/tag-out	No finding	Procedures for alarm management, permitting and lock-out/tag-out have been developed. The remaining step is to validate them before start-up.	Asset Manager: *Jake Green*

Observations

The procedures for alarm management, permitting and lock-out/tag-out have been written and refined	Jake Green
The remaining step is to validate the procedures prior to start-up	Jake Green

Potential improvements/actions

Verify status in a follow-up phase

Case for action

- **Cost:** decrease costs from running over turnaround schedule
- **Operations/commercial:** reduce the risk of supply disruptions from schedule overrun and production losses from ineffective ramp down/up processes

Industry leading practice

- Critical maintenance safety processes (e.g., alarm management, permitting, lock-out/tag-out) are developed to ensure operational safety and integrity are achieved

Implementation complexity/effort

Low 1 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
None identified	None identified	None identified

PUGET SOUND ENERGY

Procurement/materials management: Procure to Pay process(es)

	Requirement checked	Status	Observation summary	Owner
6.1	Procure to Pay (PtP) processes are developed	No finding; Optimization opportunity	PtP processes are established and incorporate some industry leading practices	Asset Manager: *Jake Green*

Observations

PtP processes are established and include Delegation of Authority, Budgeting and a Preferred Vendor program	Jake Green
Some leading practices are integrated into these based on people-dependent skillsets. All of these are not documented.	NAES
For Delegation of Authority, purchases above $250,000 require PSE approval, and purchases below $250,000 can be made by NAES with a notification to PSE	Jake Green
NAES' O&M expenses are pre-funded, whereby PSE approves the upcoming months O&M budget in advance	Jake Green
A Preferred Vendor Management Program is established to ensure costs are competitive and quality is achieved	NAES
Materials are sourced in bulk for commodity materials to secure discounts. Other materials are purchased by NAES to leverage its scale and ability to secure competitive prices.	Jake Green

Industry leading practice

- Develop PtP processes that integrates management of key procurement areas (category, vendor, contract) and corporate scale economies to enhance cost and quality of purchased services and goods

Potential improvements/actions

1. Update PtP processes to memorialize where people-dependent leading practices are not documented
2. Add a step in the Preferred Vendor Management Program to periodically test if there is an opportunity to consolidate the number vendors to increase scale economies and improve quality

Case for action

- **Costs**: reduce material purchase cost
- **Quality/supply chain**: increase quality and supply chain reliability

Implementation complexity/effort

Low **1** 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
None identified	Minimal effort to refine processes	None identified

PUGET SOUND ENERGY

Procurement/materials management: Inventory management process

	Requirement checked	Status	Observation summary	Owner
6.2	An inventory management process is established	No finding; Optimization opportunity	NAES will manage inventory, but there is no process. Levels will be reviewed ad hoc, though there may be benefits from a set frequency.	Asset Manager: *Jake Green*

Observations

NAES will manage inventory using Maximo. There is no process developed for managing inventory.	Jake Green
Inventory levels, re-order points (ROPs), and re-order qualities (ROQs) will be determined based on OEM recommendations	Jake Green
Initial inventory levels purchased will be based on OEM recommendations and available budget	Jake Green
Inventory levels will be reviewed on an ad hoc basis to identify materials that are over or under-stocked	Jake Green
There is minimal risk of obsolescence due to the size and point in the lifecycle of the plant	Jake Green
No indication noted for how inventory levels will be updated as spares are utilized or if/how Maximo will notify NAES if materials are understocked	Documents reviewed

Industry leading practice

- An inventory management process is established that defines and manages inventory levels, ROPs, and ROQs based on criticality, lead times, and order costs

Potential improvements/actions

1. Create a process to systematically determine if materials are under or over-stocked
2. Incorporate measures to automatically notify NAES if critical materials are understocked
3. Incorporate key procurement KPIs in NAES scorecard (e.g., work orders waiting on parts, book value of overstocked)

Case for action

- **Costs**: avoid equipment/delivery costs if replacement materials require expediting
- **Reliability**: increase system integrity

Implementation complexity/effort

Low **1** 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Minimal incremental training to monitor inventory on a set frequency	Minimal effort to create inventory management process	Minimal additional technology may be required

PUGET SOUND ENERGY

Procurement / materials management: system established and updated with as-built equipment

	Requirement checked	Status	Observation summary	Owner
6.3	An inventory management system is established and updated with as-built equipment, inventory, ROPs and ROQs	No finding	Maximo will be the inventory management system. As-built equipment and spares are being updated in Maximo concurrent with installation.	Asset Manager: *Jake Green*

Observations

Maximo will be the inventory management system, and NAES will use it to manage inventory	Jake Green
NAES is uploading the as-built equipment into Maximo concurrent with the installation of the respective equipment	Jake Green
Key details required for inventory management, such as actual inventory levels, ROPs and ROQs, will be added to Maximo once the equipment is installed	Jake Green

Potential improvements/actions

1. Validate Maximo is updated with installed equipment and actual spares purchased, prior to commencing operations

Verify in a follow-up phase

Case for action

- **Costs**: avoid equipment/delivery costs if replacement materials require expediting
- **Reliability**: increase system integrity

Industry leading practice

- An inventory management system is established and updated (pre-start up and on-going during operations) with as-built equipment, current inventory levels, ROPs and ROQs to ensure materials are available per the inventory strategy

Implementation complexity/effort

Low **1** 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
None identified	None identified	None identified

PUGET SOUND ENERGY

Operating Model: fit-for-purpose field & technical staff

	Requirement checked	Status	Observation summary	Owner
7.1	Organization size/set-up are fit-for-purpose given operational realities, and the O&M costs comply with all requirements (e.g., JOA)	No finding	The initial O&M org. has been right-sized based on experience and competitive bidding. More steps are required to comply with the JOA.	Asset Manager: *Jake Green*

Observations

The JOA requires O&M costs are reasonable, prudent and consistent with market pricing	JOA
NAES will operate and maintain the facility, which will be supported by on and off-site staff	JOA
The initial O&M organization roles, size and costs have been checked for reasonableness and NAES was selected through a competitive bid process	Jake Green
On-site staff includes 16 personnel and has been streamline to extent possible without sacrificing safety	Jake Green
Off-site staff will provide technical support, which will be from NAES and a subcontracted third party engineering consultancy (Lisbon) who will provide two dedicated FTEs	NAES
In the 2Q21 after start-up, PSE will evaluate NAES' cost and staffing levels to ensure they are reasonable and prudent. Checks will be documented.	Jake Green

Industry leading practice

- Design fit-for-purpose organization structure (i.e., leadership, field, technical, and Front/Back office) that provides the required capabilities to safely and reliably operate the plant, while scaling the workforce with the operational realities (e.g., material change in production levels)

Potential improvements/actions

1. Benchmark O&M organization roles, FTE count, and costs for NAES versus analog LNG plants
2. Right-size (add/remove) roles where warranted, and document results to comply with the JOA

Review in a follow-up phase

Case for action

- **Cost**: avoid budget surprises from required support and reduce costs from negotiating rates up front
- **Reliability**: improve reliability/integrity from extended downtime caused by lack of available resources

Implementation complexity/effort

Low **1** 2 3 4 5 *High*

Level of capability & skill change	Governance & process change	Availability of data & technology
Minimal effort to engage SMEs to verify required roles in-place	Minimal effort to adjust org charts if/ once additional roles identified	None identified

PUGET SOUND ENERGY

Appendices

PUGET SOUND ENERGY

Facility economics (1 of 2) – asset returns challenged, impacted by sales timing

Deceleration from initial plans to sell out PLNG LNG capacity by 2022 to current plans of 2027 results in decreasing the Tacoma LNG [redacted] below the common industry hurdle rate of 8%[1]

- Multiple events resulted in the deceleration of sold capacity projections for PLNG from original business plans
- The decelerated sales projection results in further challenging the Tacoma LNG investment returns and asset value [redacted]
- Achieving an 8% IRR requires improving the current Tacoma LNG NPV to $49M, versus current NPV o[redacted]

PUGET SOUND ENERGY

Notes: (1) Based on pro-forma economics provided by Management as of November 2020.

Facility economics (2 of 2) – potential levers exist to improve asset value

While there are plans to bolster the sales pipeline, there are other levers to exploit that could significantly improve asset value and return on investment. Items below are typically available to small-scale LNG producers; they may or may not be applicable for Tacoma LNG (evaluation required).

Area of opportunity	Potential improvement opportunities based experience with other LNG assets	Plan to capture opportunity		
		Yes	Partial	No
Volume driven				
Bunkering customers	• Actively target bunkering customers (e.g., ship and cruise lines) with open commitments • Tailor supply/delivery method to maximize uptake of customers (e.g., acquire/lease bunker barge)	✓		
Other LNG customers	• Cast a wide net and evaluate viability for other LNG/gas customers that are nearby the facility or could be supplied via delivery (e.g., supply industrial power customers by "milk-runs") • Tailor supply/delivery method to maximize uptake of local customers. Establish scalable sales staff structure to accelerate achieving and maintaining the sales strategy (e.g., hire temporary sales staff to attack market).		✓	
Volume maximization	• Establish systematic process to steward reliability and availability, identify and develop action plans to address upsets/events, and prioritize intervention efforts • Determine incremental LNG sales to justify second train; actively pursue identified amount.		✓	
BOG	• Assess impact of BOG on plant efficiency and optimize BOG usage (e.g., minimize recycle)			✓
Margin driven				
Trading	• Provide traders with the optionality for the time, size, source and method of gas purchases to optimize costs incurred • Ensure traders are incentivized and purchase gas exclusively for entities they represent			✓
Third party spend/O&M	• Benchmark third party spend and O&M against analog LNG assets to test if the org's size/structure are right-sized and highlight potential opportunities to streamline O&M costs		✓	
By-products	• Evaluate and maximize commerciality of by-products generated through LNG operations		✓	
Enabler				
Performance management	• Clarify business value drivers and establish clear stewardship of P&L and value drivers • Systematically steward performance through scorecards with KPIs and sub-KPIs that measure performance across the key business areas and underpinning drivers		✓	

Illustrative KPIs for LNG operations (1 of 2)

Category	Sub-category	KPI	Description
Production	Variance	Planned vs. actual production	Planned vs. actual production volume (liquefaction and vaporization)
		Reliability	Ratio of volume produced to the total production potential, if no downtime occurred
		Availability	Ratio of time the plant (liquefaction and vaporization) is operable to the total time in a given period
	Downtime	Total downtime	Total volume below the production potential[1] that is not produced
		Planned downtime	Planned volume below the production potential that is not produced, typically tracked daily
		Unplanned downtime	Unplanned volume below the production potential that is not produced, typically tracked daily
	Capacity	Idle economic	Additional volumes that the plant could produce if investment was made, whereby benefits exceed costs
		Idle uneconomic	Additional volumes that the plant could produce if investment was made, whereby costs exceed benefits
		Idle market	Additional volumes that the plant could produce if market/regulatory constraints were lifted
		Consumed (fuel/flare)	Volumes that could be produced if they were not consumed in operations (e.g., flared, used for fuel)
Maintenance	Performance	Planned vs. actual spend	Planned vs. actual maintenance spend
		Planned vs. completed work orders	Planned vs. actual work orders completed
	Planning	Work backlog	Amount of maintenance hours that is ready to be performed, based on fit-for-purpose sized staff
		Open work orders by status	Work orders that are created and not completed, whereby status indicates the reason they are incomplete
	Scheduling	Schedule compliance	Ratio of maintenance activities completed vs. planned
		LACD compliance	Ratio of work orders that have been completed before the last acceptable date vs total completed orders
	Execution	Workforce utilization	Ratio of actual hours worked to total hours available to work (e.g., 2-12 hour shifts at 6 days is 144 hours)
		MTTR	Mean time to repair. Average amount of time to complete work orders.
	Bad Actors	MTBR by equipment tag and class	Mean time between repair. Average amount of time between repairs for a given piece of equipment.
		Corrective work order count and cost (equipment tag vs. avg. by class)	Measure of corrective work order count and cost of an individual piece of equipment vs. other pieces of equipment in the equipment class. Measures are often combined in a x-y axis to show outliers.
	RCFA	RCFAs overdue	Root cause factor analyses that are open and past their scheduled date of completion
		RCFAs action items overdue	Action items from RCFAs that are open and past their scheduled date of completion
		On-schedule compliance	Ratio of RCFAs and action items completed on schedule to total RCFAs completed

PUGET SOUND ENERGY

Notes: (1) Production potential is a measure of the expected production assuming the asset was able to maintain stable volumes, typically measured on a daily basis. Leading practice for determining production potential is utilizing an empirical, non-bias approach

Illustrative KPIs for LNG operations (2 of 2)

Category	Sub-category	KPI	Description
Materials management	Inventory	Count and value of materials understocked	Count and value of inventory (e.g., equipment, lubricants) that are understocked
		Count and value of materials over stocked	Count and value of inventory (e.g., equipment, lubricants) that are overstocked
	Performance	Materials supplied on-schedule	Ratio of materials that are supplied/delivered for operations on-schedule to total supplied
		Materials supplied without defects	Ratio of materials that are supplied without defects to total supplied
		Planned vs. actual inventory value	Value of inventory held on-hand to target value
		Inventory value over time	Value of inventory over time, provides trends and enables optimizing stocking and purchasing
Marine	Performance	Planned vs. actual loadings	Count of bunkering loadings completed vs. plan
		Planned vs. actual bunkering costs	Cost incurred for bunkering vs. plan
Cost	Performance	Planned vs. actual cost	Planned vs. actual costs segmented to key categories/functions
		Rolling projected spend vs. original forecast	Evergreen projection of expected spend vs. original forecast, typically refreshed on a monthly basis and viewed as evergreen projection of annual spend vs. original plan

- This list is illustrative of key operations KPIs and is not intended to be comprehensive
- Key performance areas should be added (e.g., safety, environmental) as required to ensure Tacoma LNG is operated in a safe, compliant, effective and profitable manner

Scoring criteria for complexity/effort

Category	1. Low complexity	2. Low complexity	3. Medium complexity	4. High complexity	5. High complexity
Process maturity	• Processes institutionalized • Strategic alignment with business needs and IT-enabling value • Continuous improvement	• Standardized processes, recognized and accepted • Fully defined and integrated • Process performance measured and targeted	• Consistent and standardized • Formal documentation and training • Process owners assigned	• Different versions of same process • High reliance on individual skills and informal training • Low level of documentation	• Ad-hoc processes with low level of consistency • Non-repeatable • Chaotic
Data availability	• Key data sets available real-time and automatically generated • Data sets integrated across functions and fully utilized	• Data accurate and credible • Collection of key data sets is automated and real-time • Some data sets integrated across functions	• Accurate data available within Functions but not shared cross-functionally • Data available retrospectively, not real-time	• Key data incomplete • Key data inaccurate / low-integrity • No data owners appointed	• Key data not available • Data not digitized • Paper-based information
People & skills	• Resources currently available within current capacity constraints	• Resources require re-deployment or re-training within COP, with minimal disruption	• Resources require re-deployment or re-training within COP, with potential for significant disruption	• Resources require significant external sourcing and/or significant internal capability build	• Resources required to operate the technology unlikely to be available within or external to the organization
Governance	• No change required to existing governance structures, metrics, roles or responsibilities	• Roles and responsibilities will not be required to change, however additional governance procedures or metrics require to be developed	• Some change will be required to existing governance structures, metrics, roles and responsibilities	• Implementation of the solution will require significant changes to existing governance structures, metrics, roles and responsibilities	• Governance structure, roles and responsibilities for managing operation of the solution do not exist or are not formally defined
Availability of technology	• Technologies fully established and widespread adoption across sectors	• Technologies fully established • Multiple service providers available	• Technologies are fully developed however take-up remains limited • Limited service providers	• Products exist and are commercialized, however in initial growth phase	• Products to fulfil the Capability Statements do not currently exist in the marketplace or are in R&D/Experimental stage

Risk criteria for findings

Ranking	Definition	Financial & SOX	Operational	Reputation	Compliance & Legal	Safety
High	The impact and/or likelihood that findings noted could have significant consequences to the company.	• Significant impact to EBITDA, ROE, cashflow, capex, debt covenants or ability to pay dividends to investors • Failure of control may result in material weakness or significant deficiency	• Disruption of critical operations or services for 2 or more days impacting a significant amount of customers • Unavailability of key or critical IT services, business processes, or personnel for 12 hours or more • Ineffective and/or inefficient key processes requiring significant change that impacts results	• Long or medium-term negative impact and national or regional media coverage • Requires communication from VP level or public affairs • Long or medium-term negative impact to employee morale	• Reportable incidents requiring major project for corrective action • Class action and/or other civil litigation • Unavoidable regulatory and/or administrative penalties	Direct impact to public, employee or service provider safety
Medium	The impact and/or likelihood that findings noted may expose the company to increased risk, although they may not have significant consequences.	• Moderate impact to EBITDA, ROE, cashflow, capex, debt covenants or significant impact to balance sheet items • Failure of control does not rise above a control deficiency	• Disruption of critical operations or services for 1 or 2 days impacting a moderate amount of customers • Unavailability of key or critical IT services, business processes, or personnel for 6 to 12 hours • Ineffective and/or inefficient processes requiring change that impacts results	• Short-term negative impact and regional or local media coverage • Requires Director-led communication strategy and response • Short-term negative impact to employee morale	• Reportable incidents requiring immediate correction • Civil litigation • Regulatory and/or administrative penalties	Indirect impact to public, employee or service provider safety
Low	Findings are isolated and/or minor. Recommendations are designed to assist management in process improvements.	• Low impact to EBITDA, ROE, cashflow, capex or debt covenants • Low or negligible impact to SOX due to scoping or materiality • Control exception noted	• Disruption of critical operations or services for up to one day impacting a low amount of customers • Unavailability of key or critical IT services, business processes, or personnel for 6 hours or less • Process improvement required	• Isolated short-term negative impact and limited local media coverage • Requires Program Manager-led communication strategy and response • Isolated staff dissatisfaction	• Reportable incidents requiring no follow up • Potential for civil ligation • Potential for regulatory and/or administrative penalties	Low and indirect impact to public, employee or service provider safety