



Agenda

Port & Harbor Advisory Commission Worksession

Tuesday, March 05, 2024 at 5:30 PM

City Hall Cowles Council Chambers In-Person & Via Zoom Webinar

Homer City Hall

491 E. Pioneer Avenue
Homer, Alaska 99603
www.cityofhomer-ak.gov

Zoom Webinar ID: 925 6798 0403 Password: 278396

<https://cityofhomer.zoom.us>
Dial: 346-248-7799 or 669-900-6833;
(Toll Free) 888-788-0099 or 877-853-5247

CALL TO ORDER, 5:30 P.M.

AGENDA APPROVAL

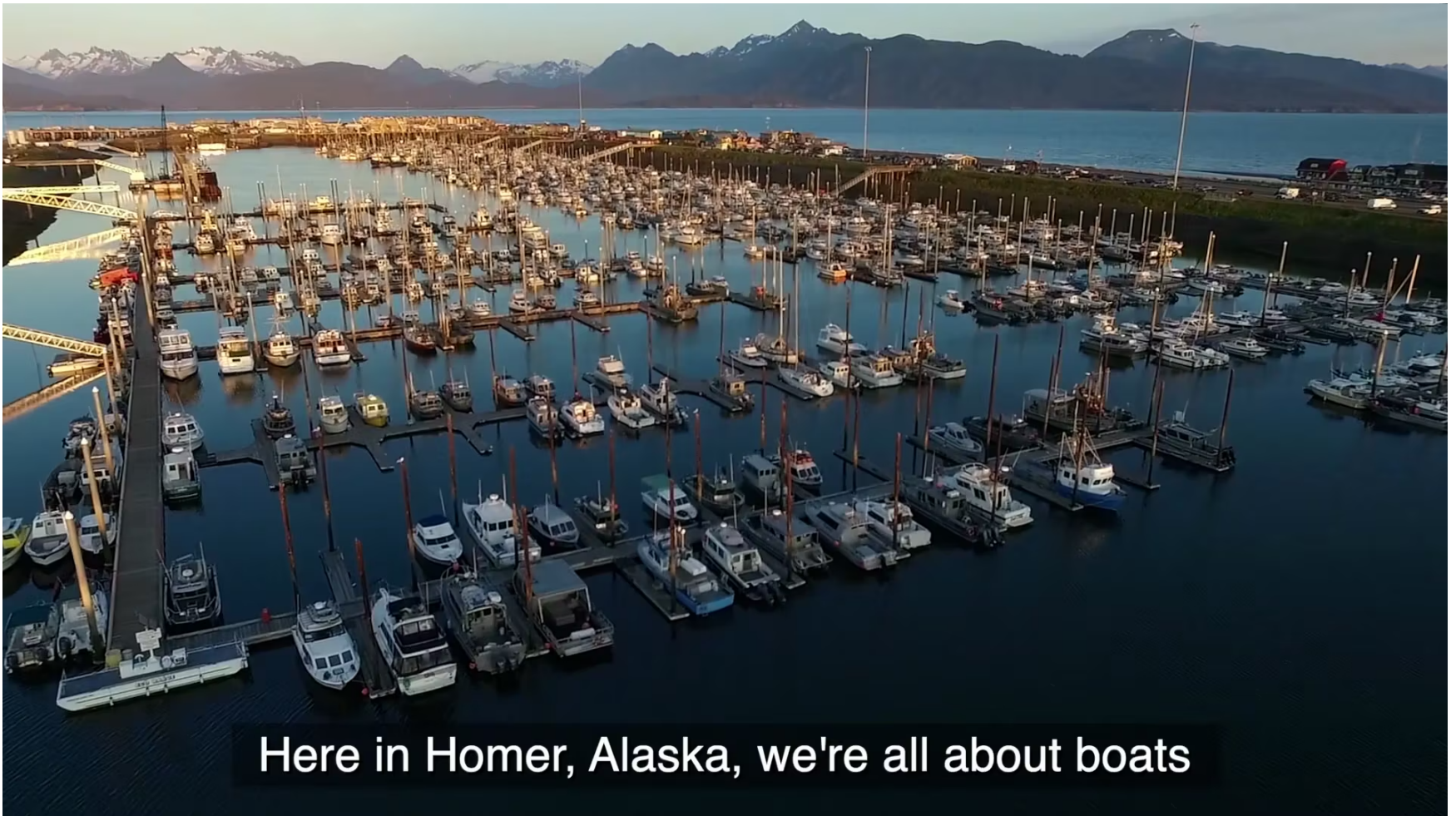
DISCUSSION TOPIC(S)

- A. Presentation from Michael Jones
- B. Other Agenda Items

COMMENTS OF THE AUDIENCE (3 minute time limit)

ADJOURNMENT

Next Regular Meeting is **Wednesday, March 27th, 2024 at 5:30 p.m.** All meetings scheduled to be held in the City Hall Cowles Council Chambers located at 491 E. Pioneer Avenue, Homer, Alaska and via Zoom Webinar.



Here in Homer, Alaska, we're all about boats

Homer Harbor Commission Work Session
Commercial Items to Consider for Harbor Expansion

Michael L. Jones

March 5, 2024

Items for Consideration

Remember the Core Purpose of the Harbor and avoid 'mission creep' in the design of the harbor expansion

Mission Creep Examples

Risk management and Commercial Considerations

Core Purpose

“The mission of the Port and Harbor Department is to provide safe port and harbor facilities for our commercial clients, recreational users, and the general public, to manage and maintain these facilities cost effectively, and to administer our Tariff and procedures fairly and equitably for all users.”

“We’re All about the Boats”

2 principles to consider

“Stick to your knitting”

“Make me indifferent”

Mission Creep Examples

Include Renewable Electric Generation Resources

Include Fish passage

Renewable Generation/Greenhouse Gasses

From City of Homer Climate Action Plan Progress Report Dated February 2021:

“In 2009 The City of Homer adopted a Climate Action Plan (CAP) to battle the deleterious effects of climate change. ...The greenhouse gas (GHG) reduction strategy outlined in the plan has been implemented in phases over the past decade...”

Typical thought process:

“We need to deploy alternative forms of electricity generation that reduce GHG or diversify the generation mix...no matter...”

- 1) How inconsequential the benefits,
- 2) How expensive, or “Defective” the technology may be
- 3) The risk involved

Inconsequential Benefits: GHG

The Port Facilities constitute the largest annual City of Homer electricity use (~291kW)

Electricity Consumption Table from the Climate Action Plan Progress Report for 2019:

1. Table 1 Monthly KWH by City sector

| Sector | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | ANNUAL |
|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Airport | 14840 | 13880 | 11920 | 11000 | 13040 | 11000 | 10760 | 10560 | 11000 | 11480 | 11800 | 10680 | 141960 |
| Buildings & Facilities | 83856 | 74944 | 64557 | 59073 | 55954 | 49009 | 43554 | 43400 | 45402 | 49215 | 52760 | 62487 | 684844 |
| Port Facilities | 219687 | 200407 | 213151 | 200364 | 191680 | 207760 | 186103 | 258680 | 235357 | 195368 | 230883 | 210061 | 2549054 |
| Scoutlights & Traffic Facilities | 16576 | 12788 | 11194 | 9548 | 6980 | 5222 | 4826 | 5638 | 8943 | 10786 | 15961 | 15099 | 125311 |
| Wastewater Facilities | 105372 | 99083 | 94543 | 99643 | 94324 | 97958 | 100863 | 102087 | 119584 | 103920 | 105445 | 105372 | 1229172 |
| Water Delivery Facilities | 58710 | 61246 | 56369 | 55821 | 53991 | 57501 | 56142 | 53799 | 54111 | 52474 | 50546 | 54211 | 671214 |

Port Facilities GHG emissions calculated from the annual electricity consumption value is 2,103,946.21 lbs which equals **954** metric tons in 2019.

Total United States Emissions in the Electric Energy Sector is **1,439.8** MILLION metric tons

The Homer Port Facilities account for **0.0000** ⁷ % of the total US electricity related emissions

Inconsequential Benefits: GHG

As noted, the Homer Port Facilities account for **0.000066%** of the total electricity related emissions in the United States

Additionally, Alaska's electric generating sector is an inconsequential contributor to National (and worldwide) GHG's.

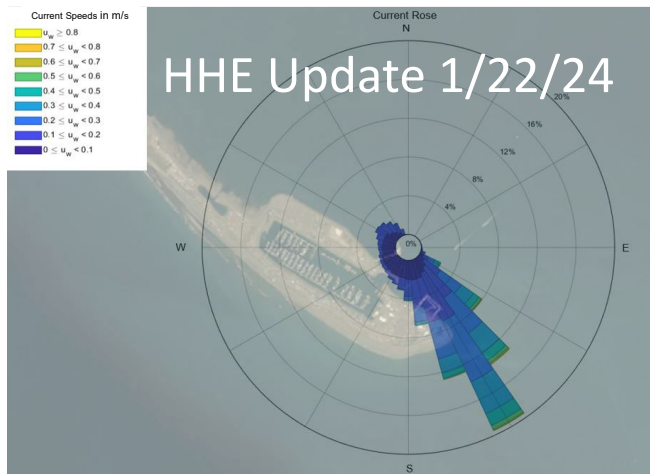
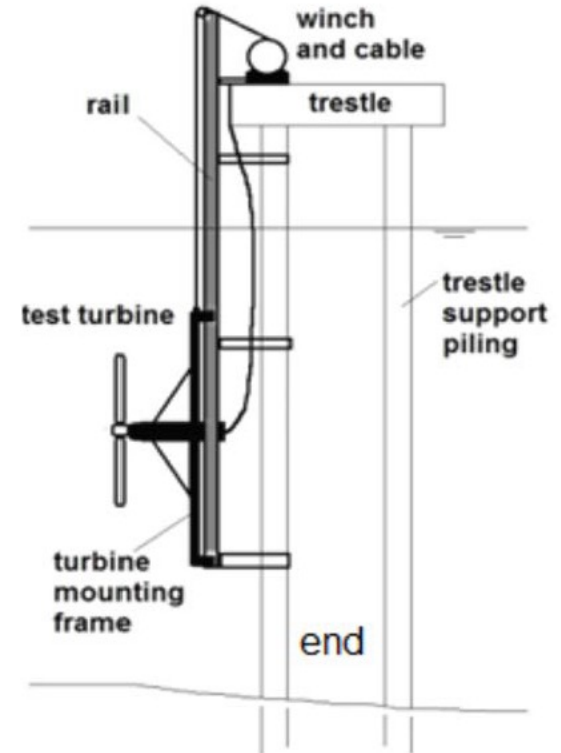
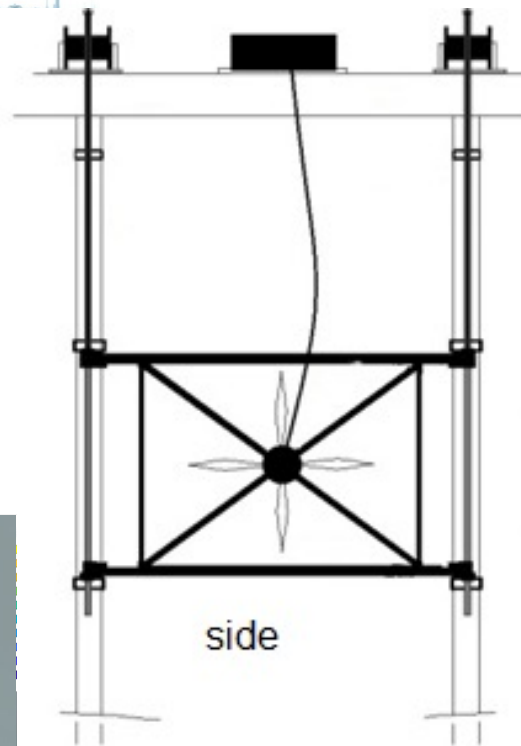
- Alaska is currently ranked 40th in the Nation for greenhouse gas emissions (GHGs).
- Alaska contributes less than 1% of the Nation's total GHGs.
- Alaska's electricity generation sector accounts for 0.0596% of nationwide GHG emissions.

CONCLUSION: Eliminating even 100% of the Port Facilities electricity related emissions will not meaningfully contribute to GHG reductions.

BOTTOM LINE: GHG reduction arguments should not drive the scoping discussions

Diversified Energy Supply

University of Alaska Homer Tidal Power and Marine Instrument Test Station Senior Design Project Dated April 29, 2013



Dock Mounted Static rail system with a cable winch and 10 ft diameter generator

Inconsequential Benefits: Energy Supply

The Port Facilities annual electricity use: 2,549,054 kWhrs per year

10 ft diameter tidal generator would be able to produce output of 4,109 Watts (based on MAXIMUM current velocity) on the Homer Deepwater dock (UA Study).

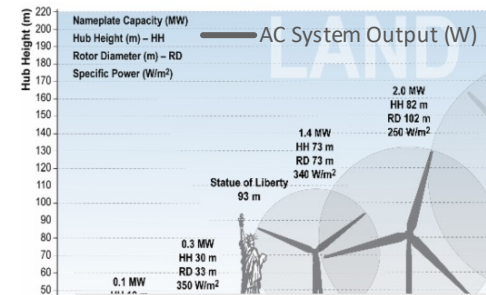
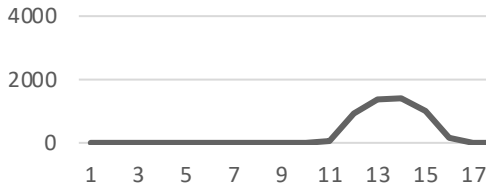
The report didn't estimate the actual annual energy production for this generator. Estimated annual output (based on a GENEROUS AVERAGE current velocity → 64 Watts) is 560,640Wh or 560.6kWh. This equals 0.022% of the Port Facilities annual electricity use per year. Requires 46 turbines → 460 linear feet of 10 ft diameter tidal generators to equal 1% of the Port Facilities annual electricity consumption.

CONCLUSION: Any proposed tidal generation resource will produce much less generation than the Port Facilities require and will not meaningfully contribute to diversification of energy supply.

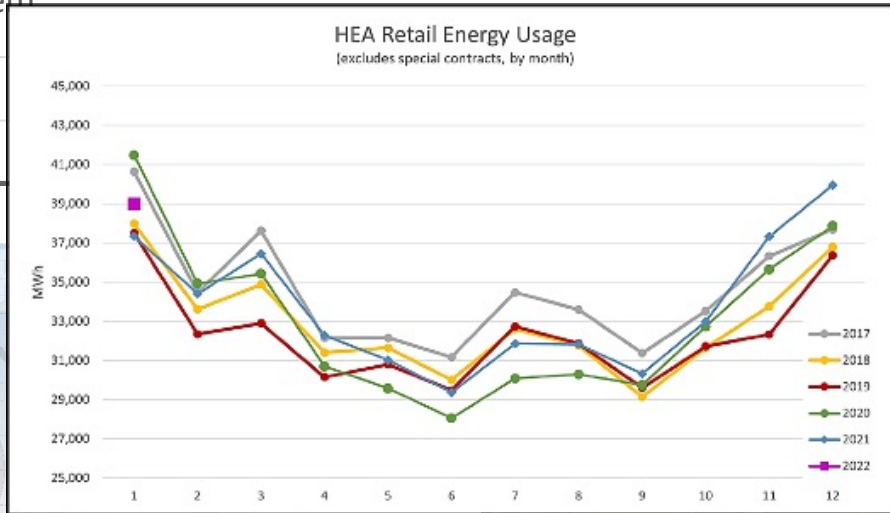
BOTTOM LINE: Energy supply diversification arguments should not drive scoping discussions

Expensive and/or "Defective" ...a whole other presentation

January 1 Hourly Solar Output
PVWatts, 8 kW dc System

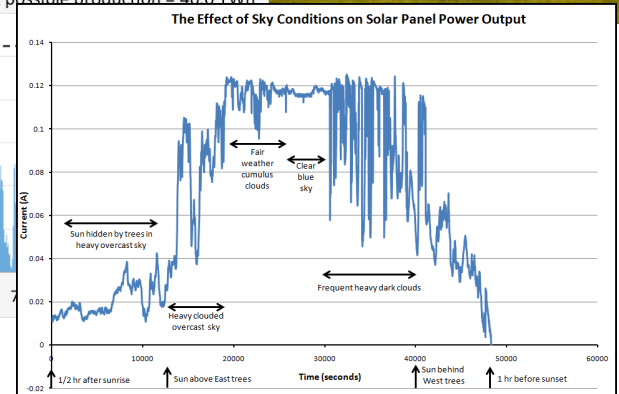
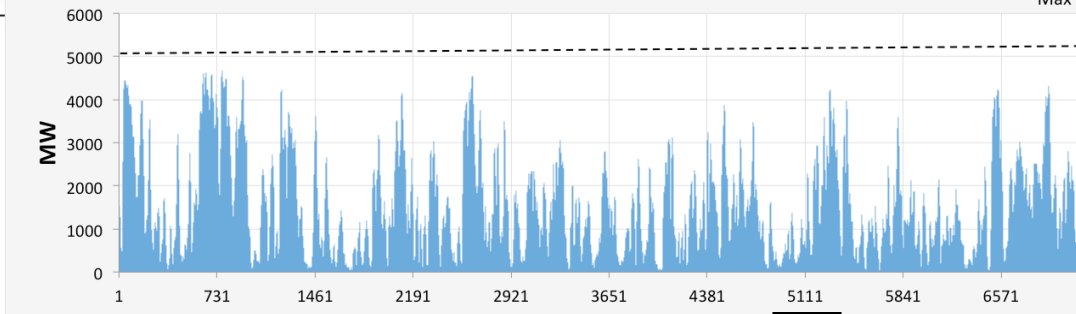


Data: <http://www.pfbach.dk/>
<http://www.windpower.org/>



Denmark real wind 2016

Installed capacity = 5070 - 5248 MW
2016 production = 12.77 TWh
Max possible production = 46.0 TWh



Risk Management

ANY activity or design feature that is not aligned with the Core Purpose of the Port and Harbor is Mission Creep. → Creates risk.

For the two Mission Creep examples listed earlier, some of the risk includes:

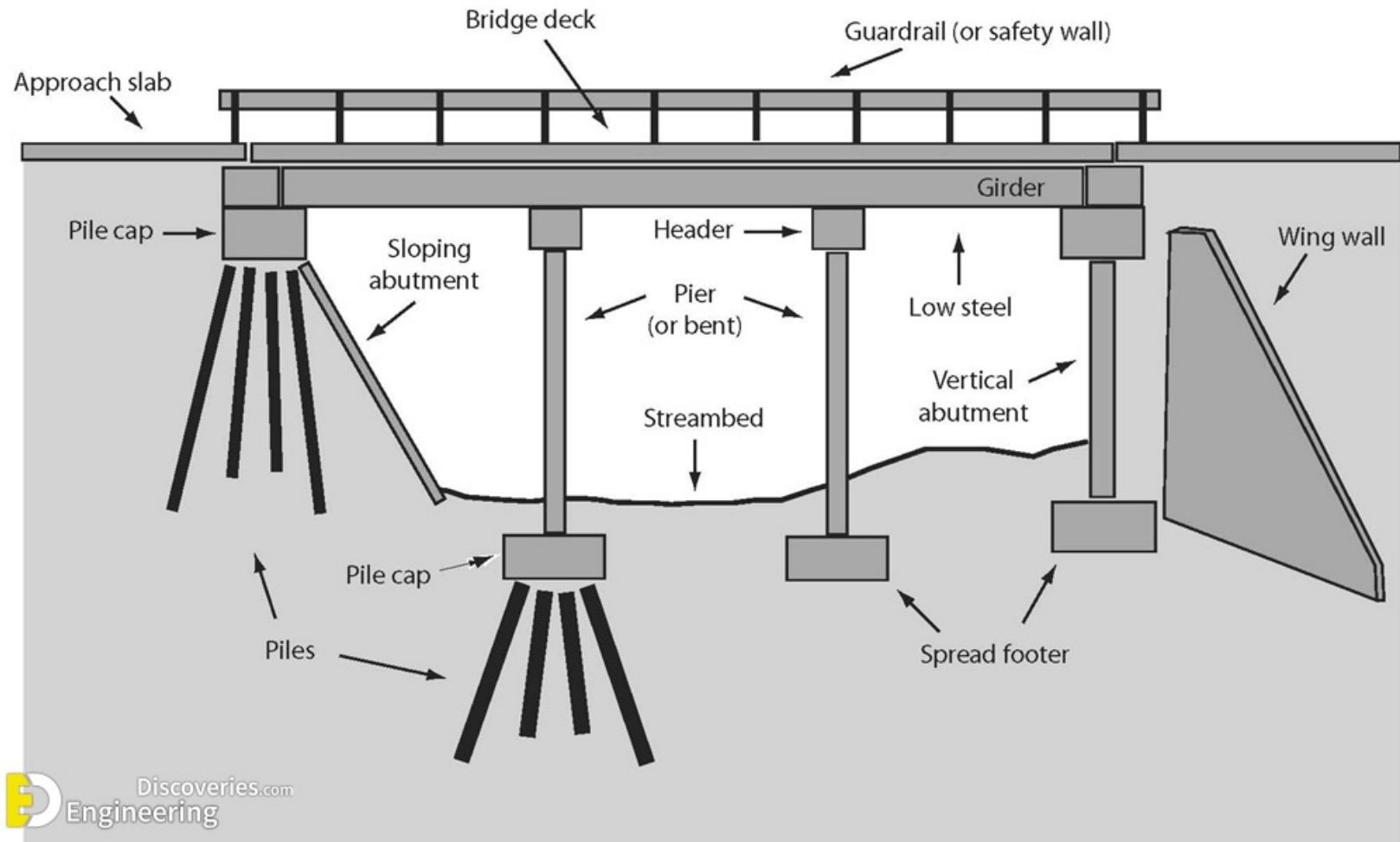
Managerial and Operational Risk:

Port and Harbor Leadership are not Power Generation experts or Fish Biologists. Mission Creep facilities will become a **distraction** and will draw resources away from day-to-day operations of the Port Facilities and may even require additional staff that are not funded.

Breakwater Integrity Risk:

Mission Creep facilities contribute to **reduced integrity of the breakwater**, either through faulty design or unexpected operating conditions.

Risk Management Illustration—Fish Passage

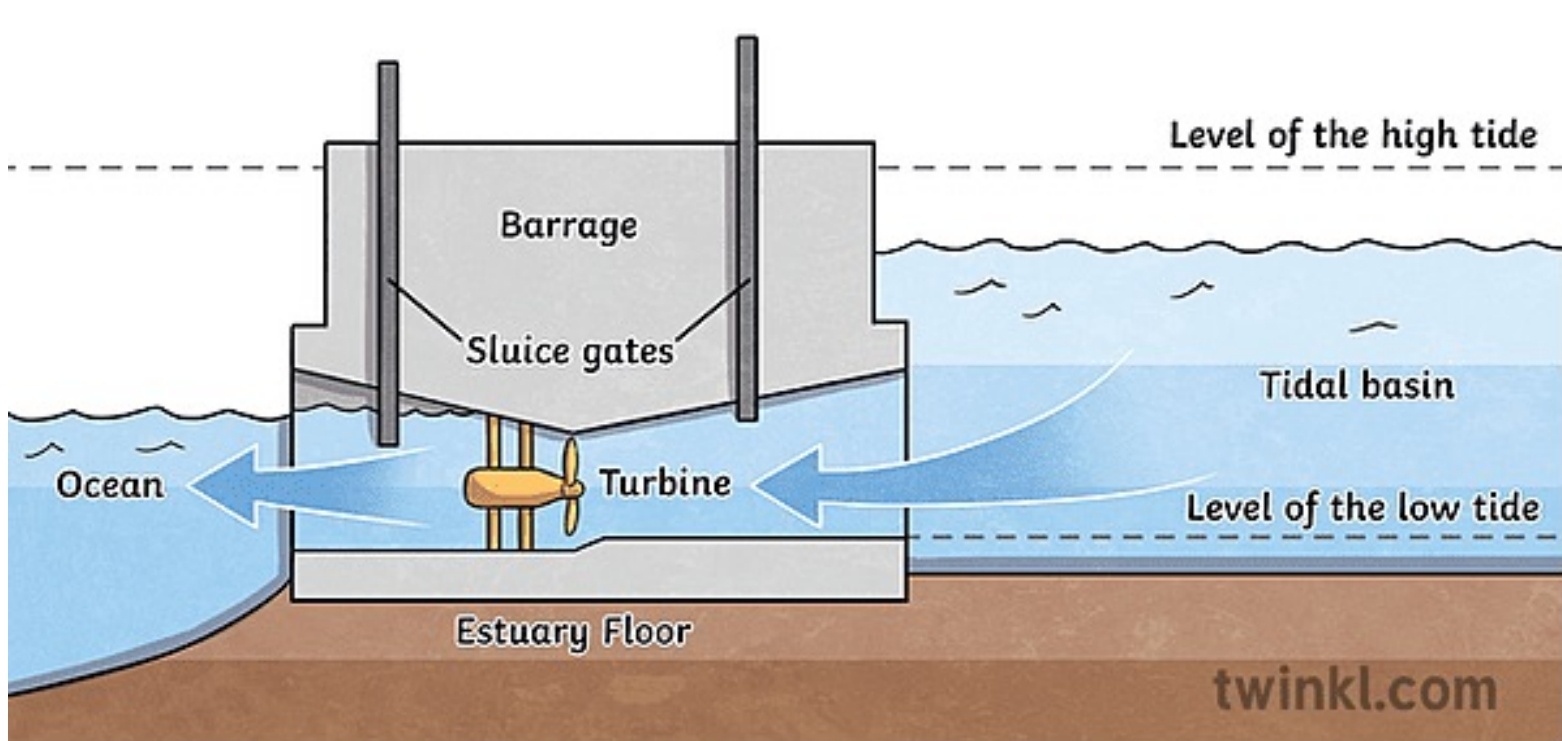


Differential Settlement
Design Load Limitations

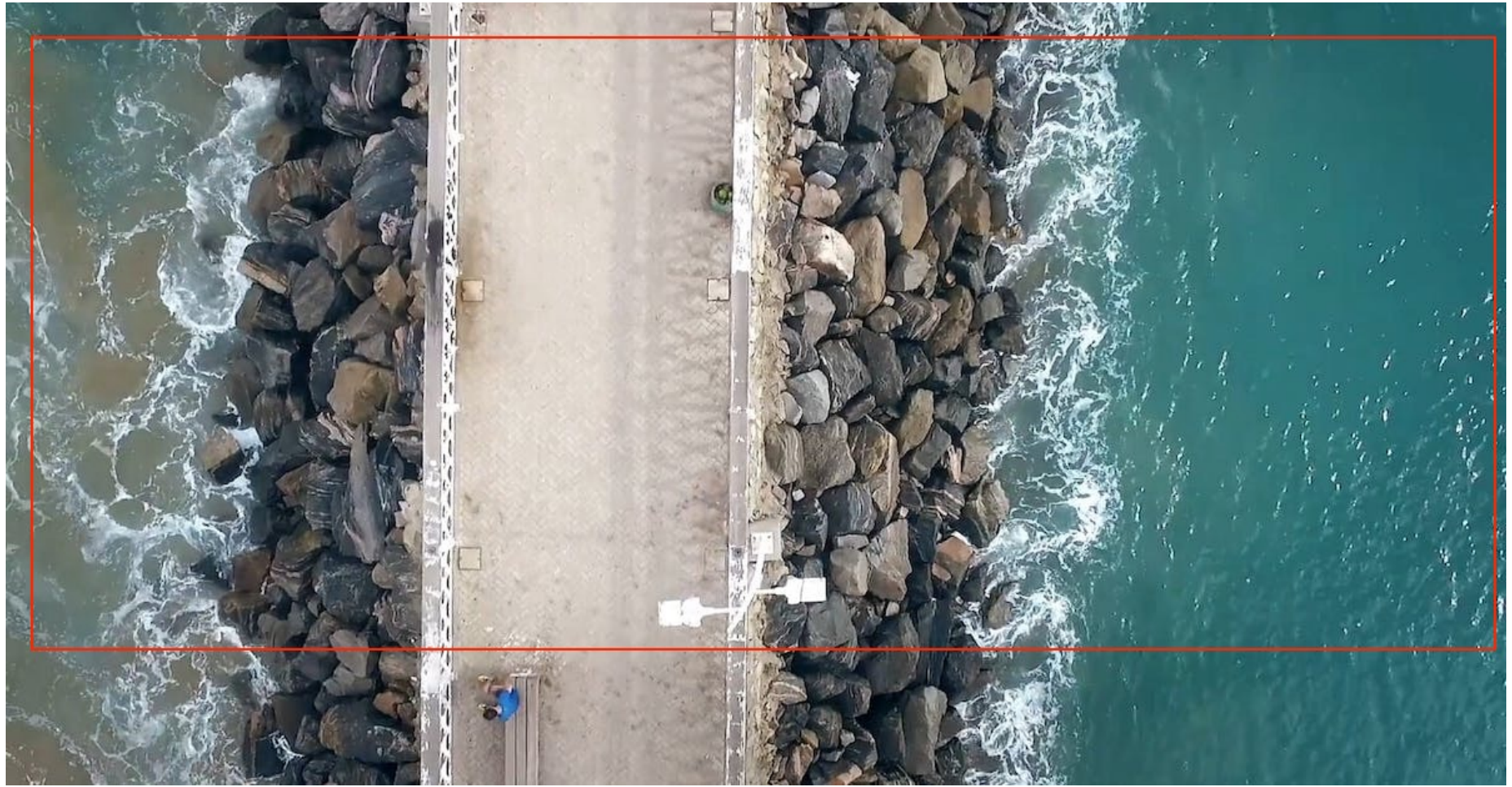
Cold Weather Performance
Frozen Deck Traffic Hazard

Oil Spill Containment
Soils/Debris Transport

Risk Management Illustration—Tidal Energy



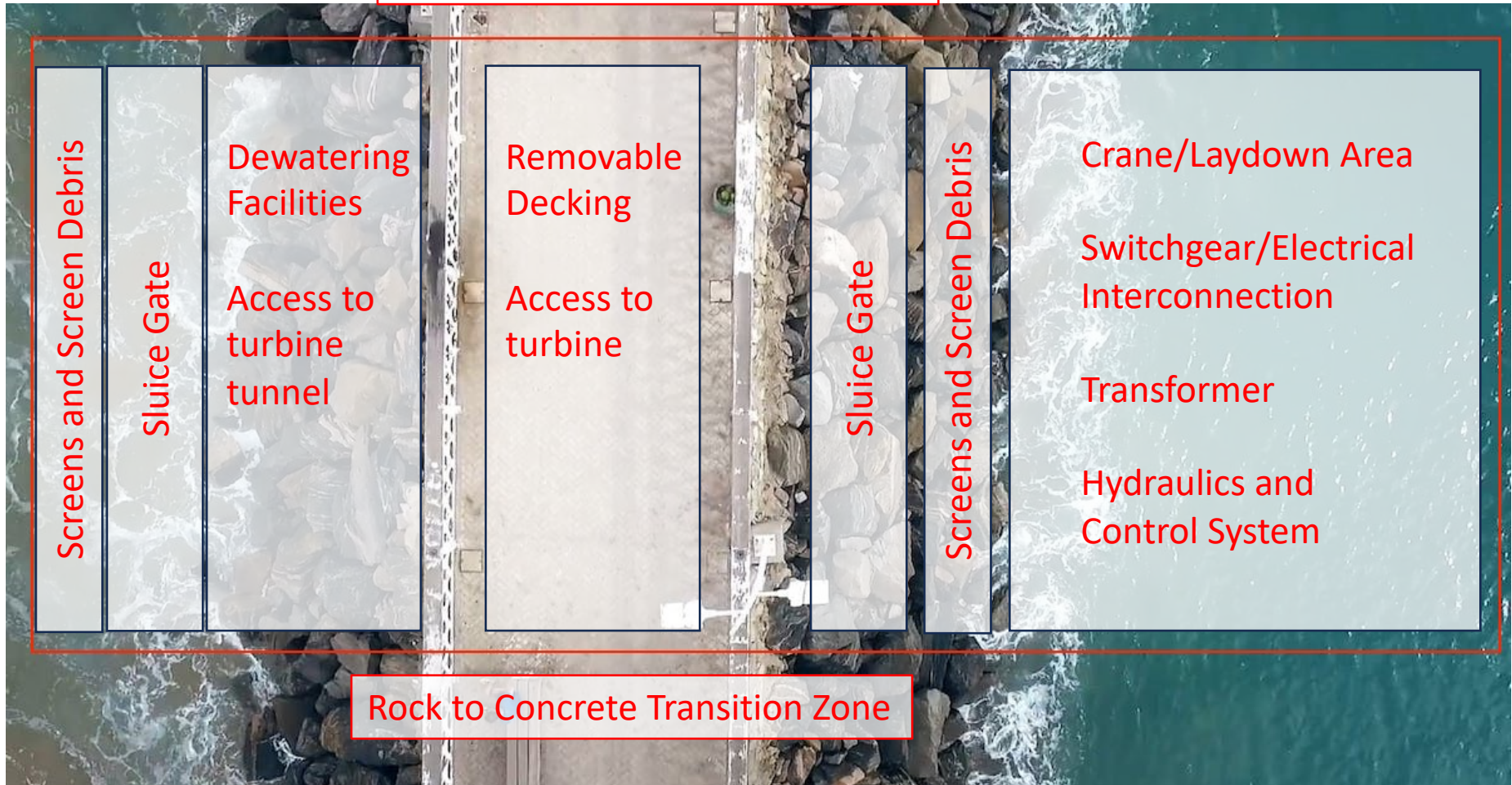
Risk Management Illustration—Tidal Energy



Footprint required for generator and to ensure access on the breakwater roadway

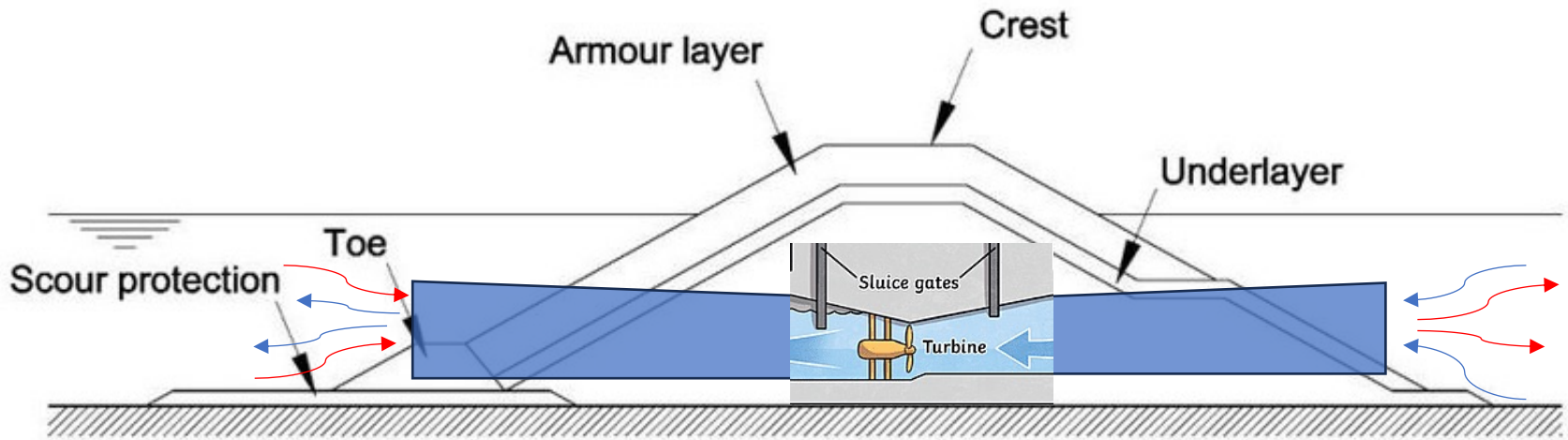
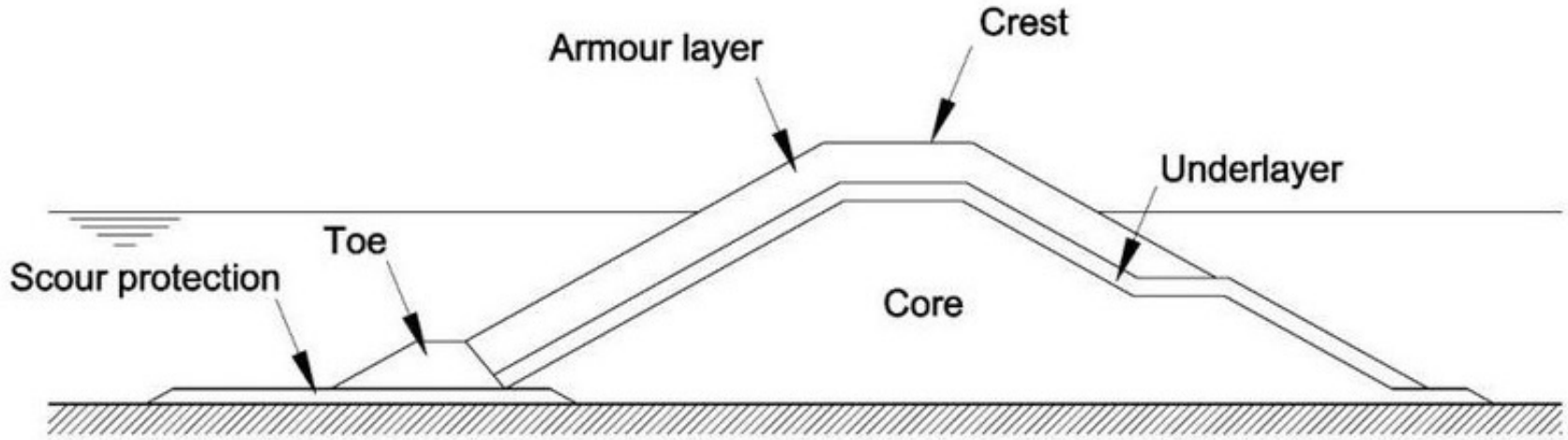
Risk Management Illustration—Tidal Energy

Rock to Concrete Transition Zone



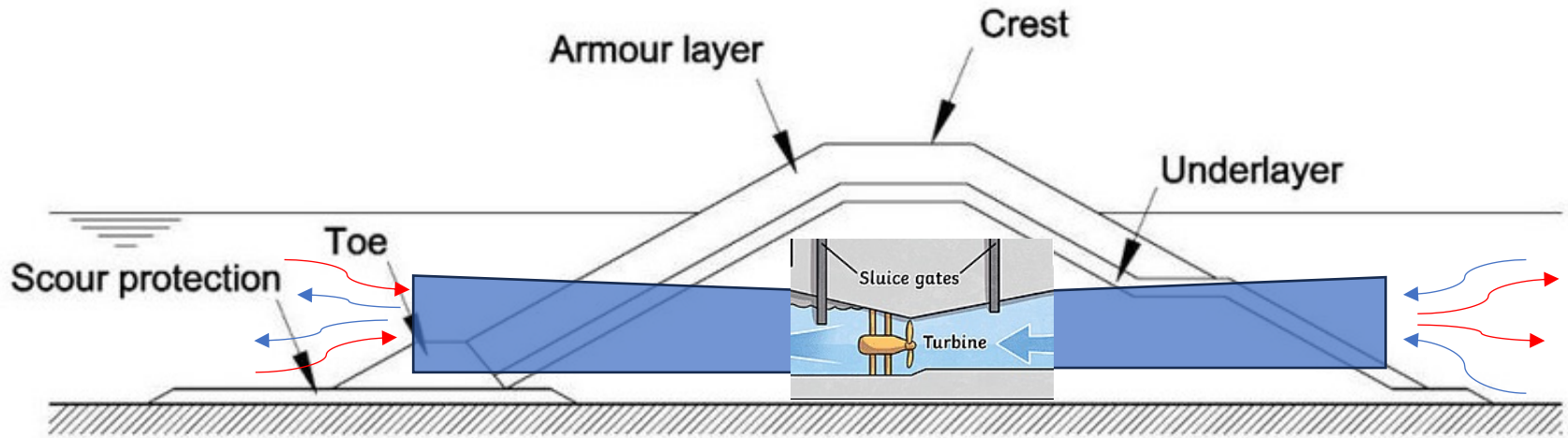
Many auxiliary features associated with the turbine-generator

Risk Management—Design: Breakwater Integrity in Rock to Concrete Transition Zones



Scouring, Settling, Seismic considerations

Risk Management—Operational: Debris



- Soils
- Kelp and other debris

What about Fish and Marine Wildlife Protection?

Stick to your knitting principle:

This is a harbor, not a place to conduct renewable R&D or to experiment with renewable technologies.

Commercial Considerations to Manage Risk: “Make Me Indifferent Principle”

Any Penetration through the breakwater:

Require advocate to pay for:

- Incremental cost of development, design and construction
- Isolation gates with Port Access and Control as a design requirement in case of emergency operation of the harbor facilities.
- Insurance against catastrophic failure and liability
- Bonding or sinking fund for long term maintenance (including dredging, armoring, differential settlement)
- Bonding or sinking fund for ultimate removal and restoration to a standard breakwater design

Commercial Considerations to Manage Risk: “Make Me Indifferent Principle”

Any generation related project: (In addition to above):

- Require a separate, unaffiliated, creditworthy entity to own and operate under a Power Purchase Agreement with HEA
- Require generation entity to pay for incremental cost of development, design and construction that also ensures continuous access to Port/Harbor facilities (unencumbered roadway) irrespective of operation of generating asset.
- Very clear delineation that responsibility for incidental take of fish and marine wildlife belongs to the unaffiliated generation entity

Conclusions

The mission creep examples highlighted here reinforce that, while they may be well intentioned, they are not risk free.

Principles to Apply:

Early offramp mission creep facilities from the evaluation process—simple analysis can eliminate items early, reduce evaluation cost, optionality, complexity and risk.

If it is desired to include mission creep features in the project scope, significant commercial risk management contract language needs to be implemented to ensure the Port, Harbor, City and harbor customers are protected from liability and remain indifferent to the existence of the mission creep features. Share these expectations early in the process.