Decommissioning Overview for Pacific OCS Region Offshore Oil and Gas Facilities

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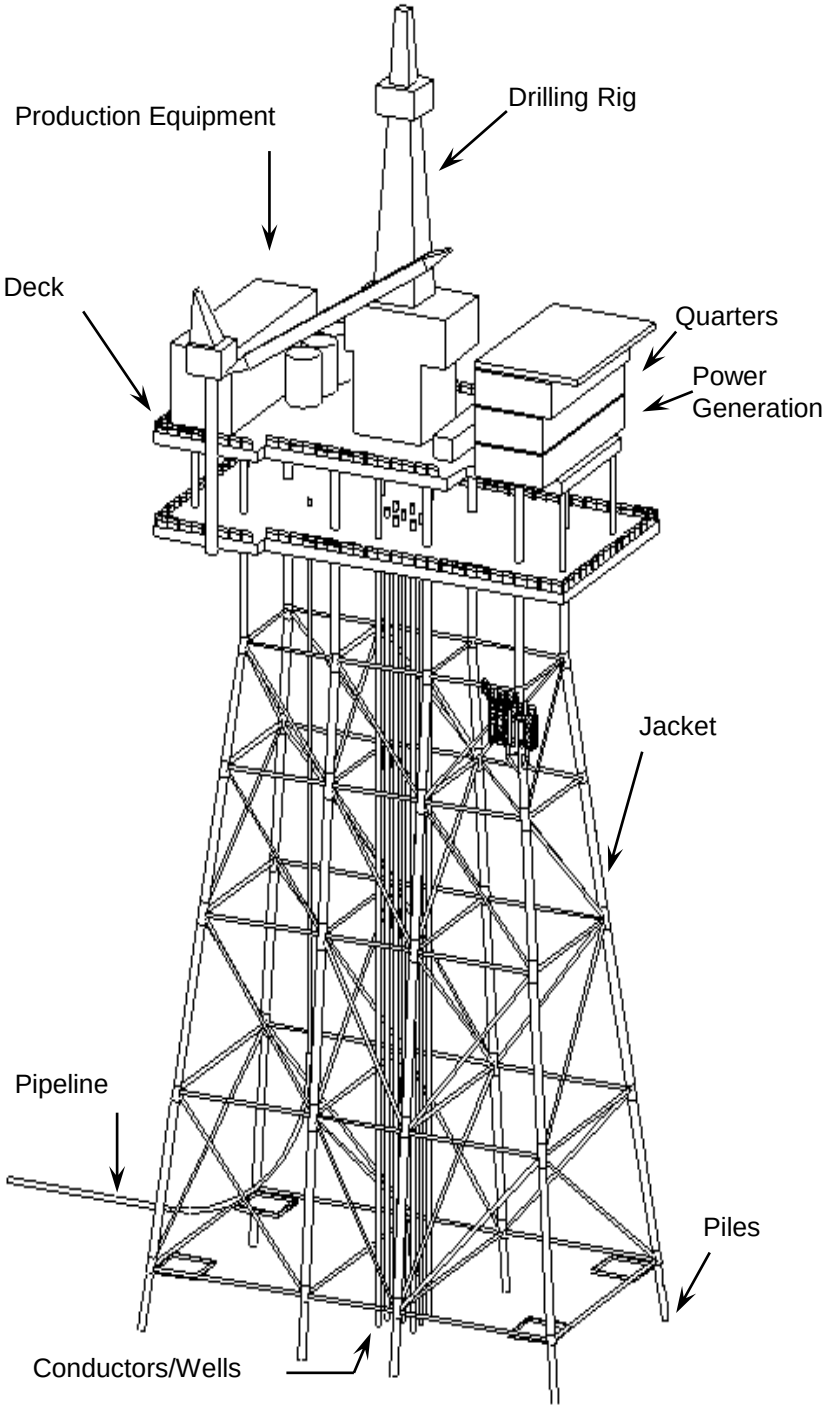
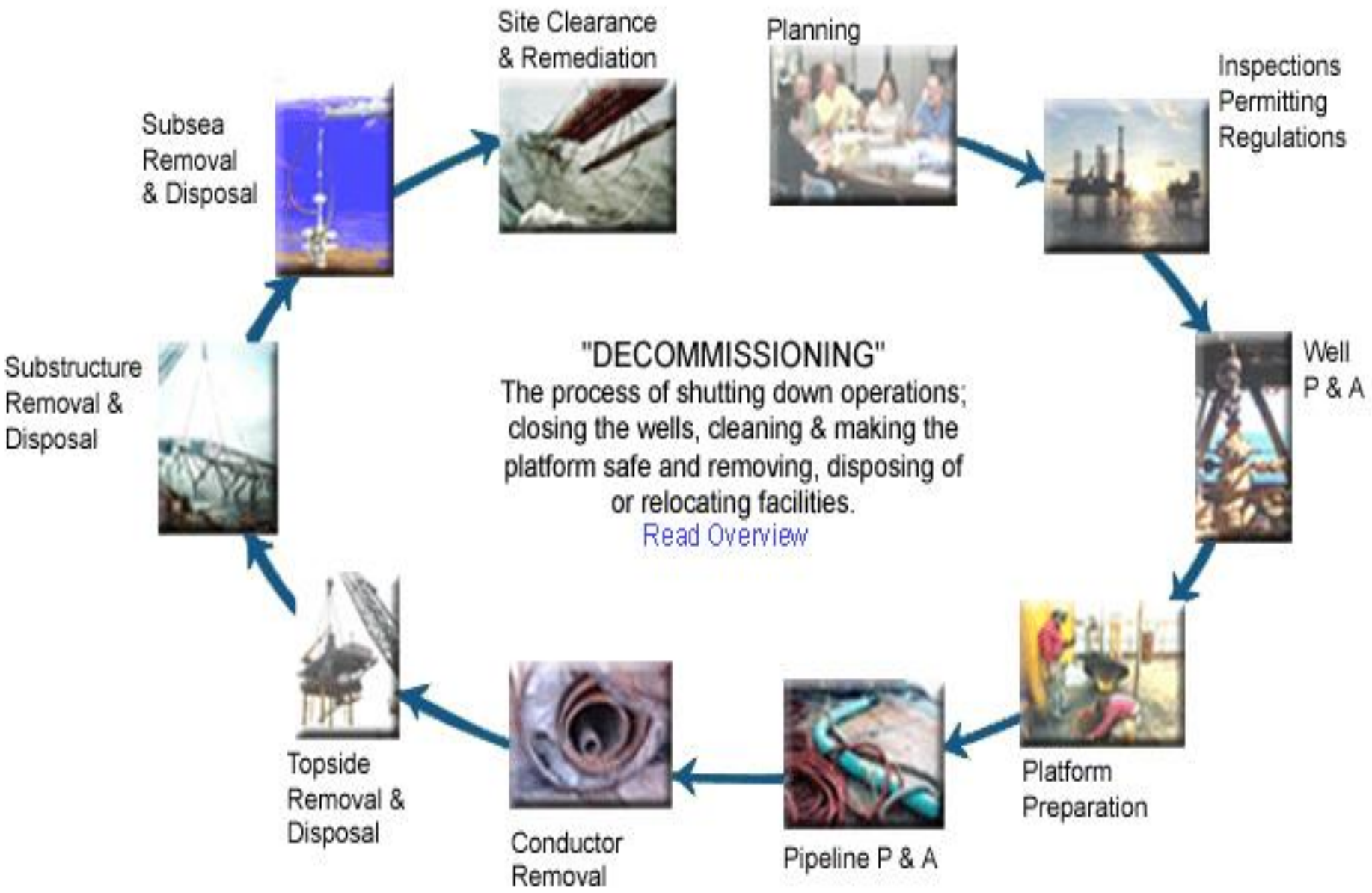
TOPICS COVERED

1. Decommissioning Basics
2. OCS Platform Overview
3. Operational Status
4. Decommissioning Outlook
5. Decommissioning Challenges

Platform Components

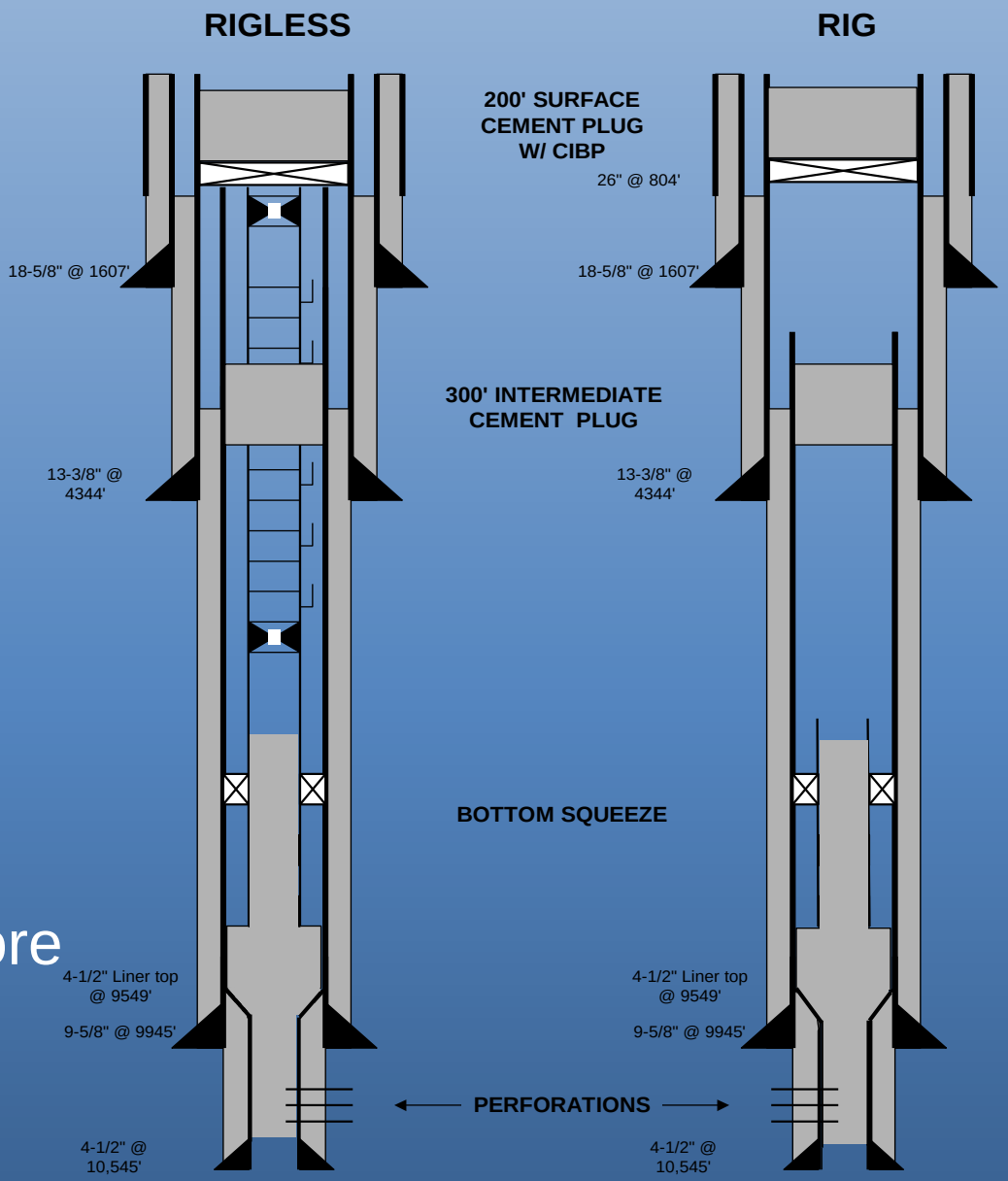


The Decommissioning Process
What is included?



Well P&A - Rig vs. Rigless

Rigless With Cut Casing and CIBP; Rig With Same but With a Little More Casing Out of Hole



Conductor Removal

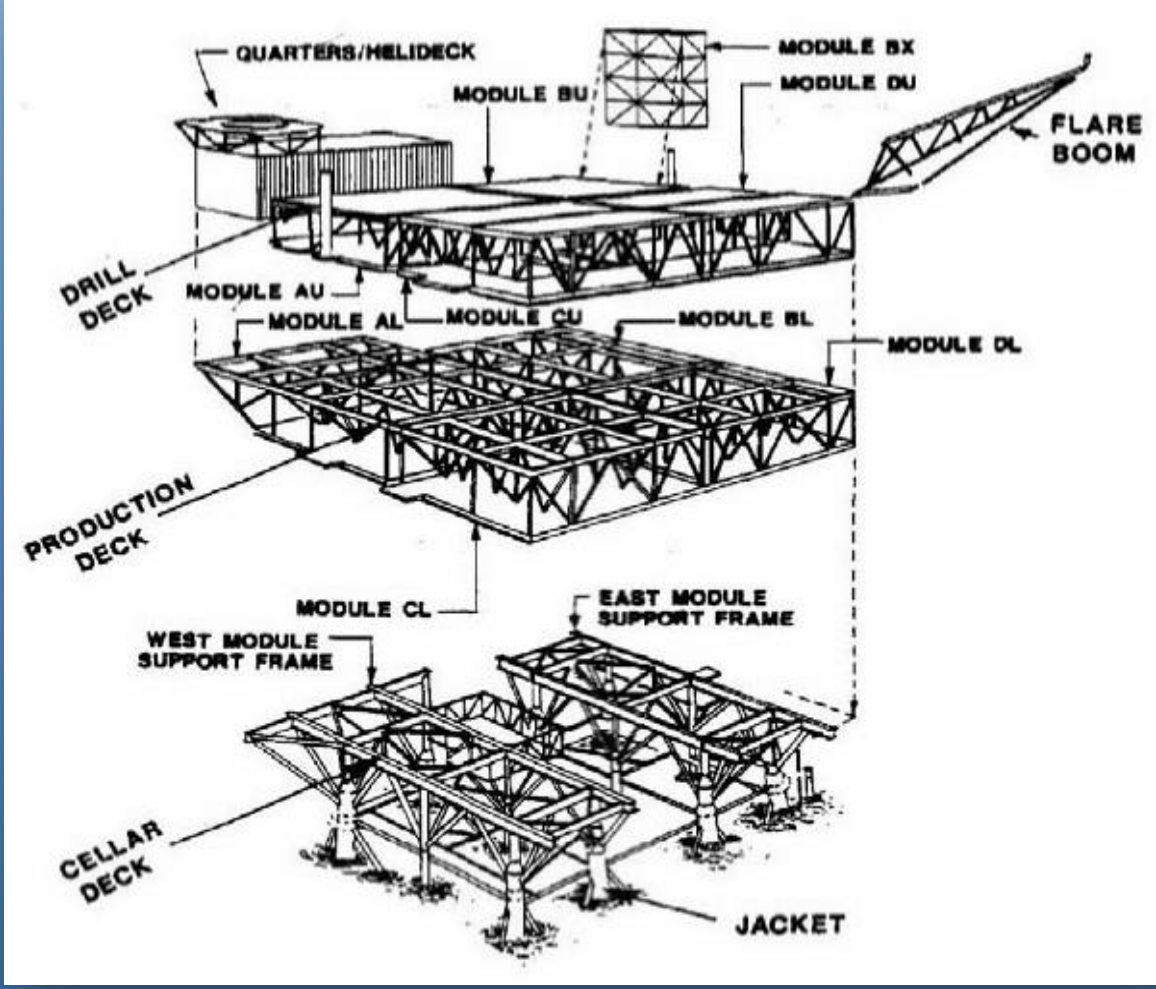
- Removed by the Derrick Barge in long joints
- Casing Jack Removal in short joints
- Severing Options:
  - Abrasive Severing (Preferred)
  - Explosive Severing
  - Mechanical Severing

Platform (Jacket & Deck) Removal

Platform (Jacket & Deck) Removal

Topside Removal

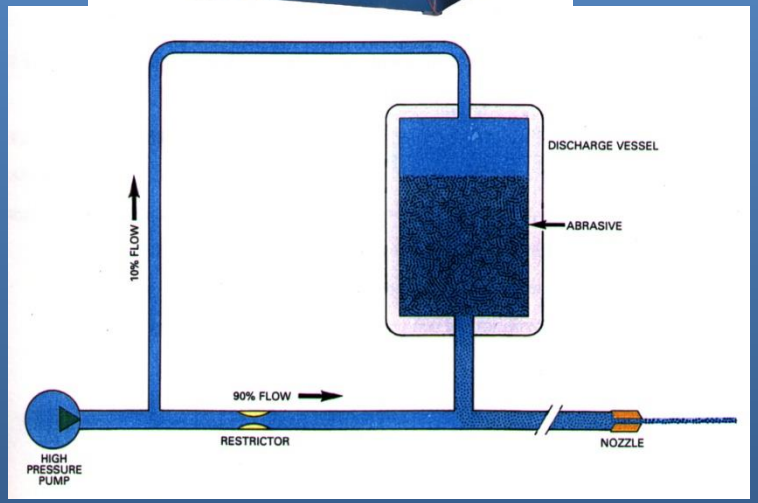
- Removed in one piece or sectioned into modules small enough (40-50% of full crane capacity) for the DB crane to remove safely and efficiently
- Transport modules to shore via cargo barge



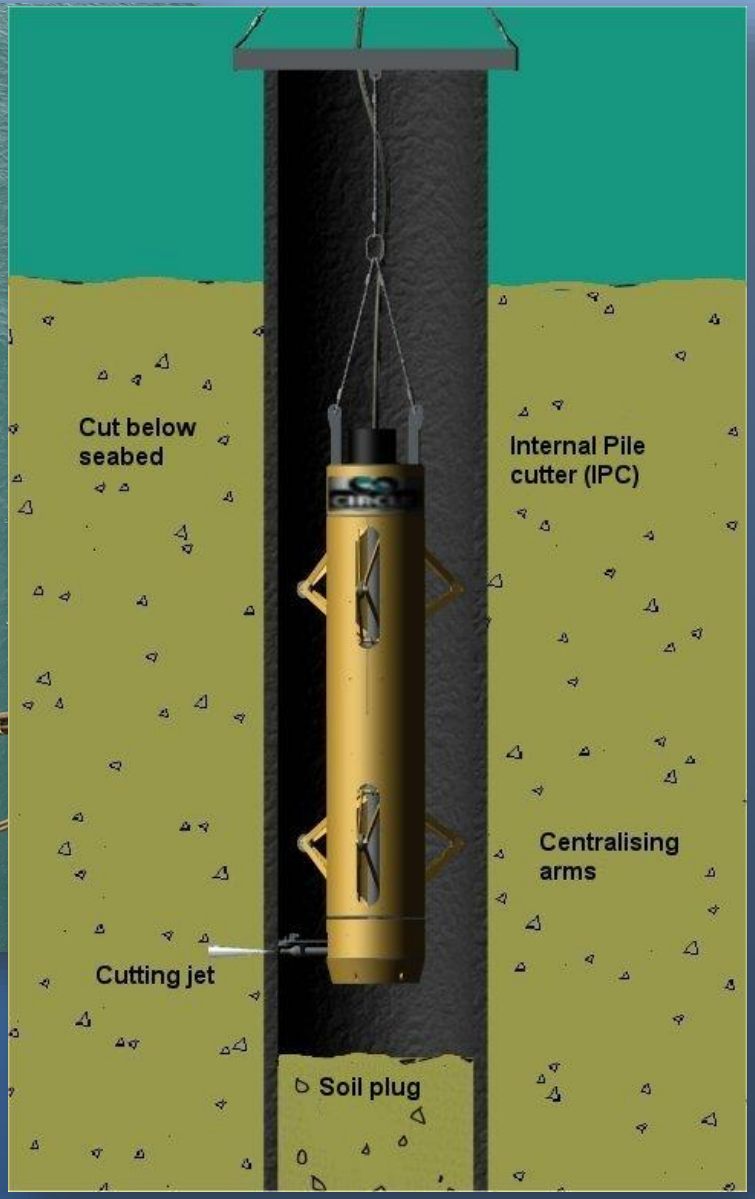
Platform (Jacket & Deck) Removal

Abrasive Cutting

- Water Abrasive Cutting w/ internal manipulators



- Water abrasive cutting w/ internal pile cutter



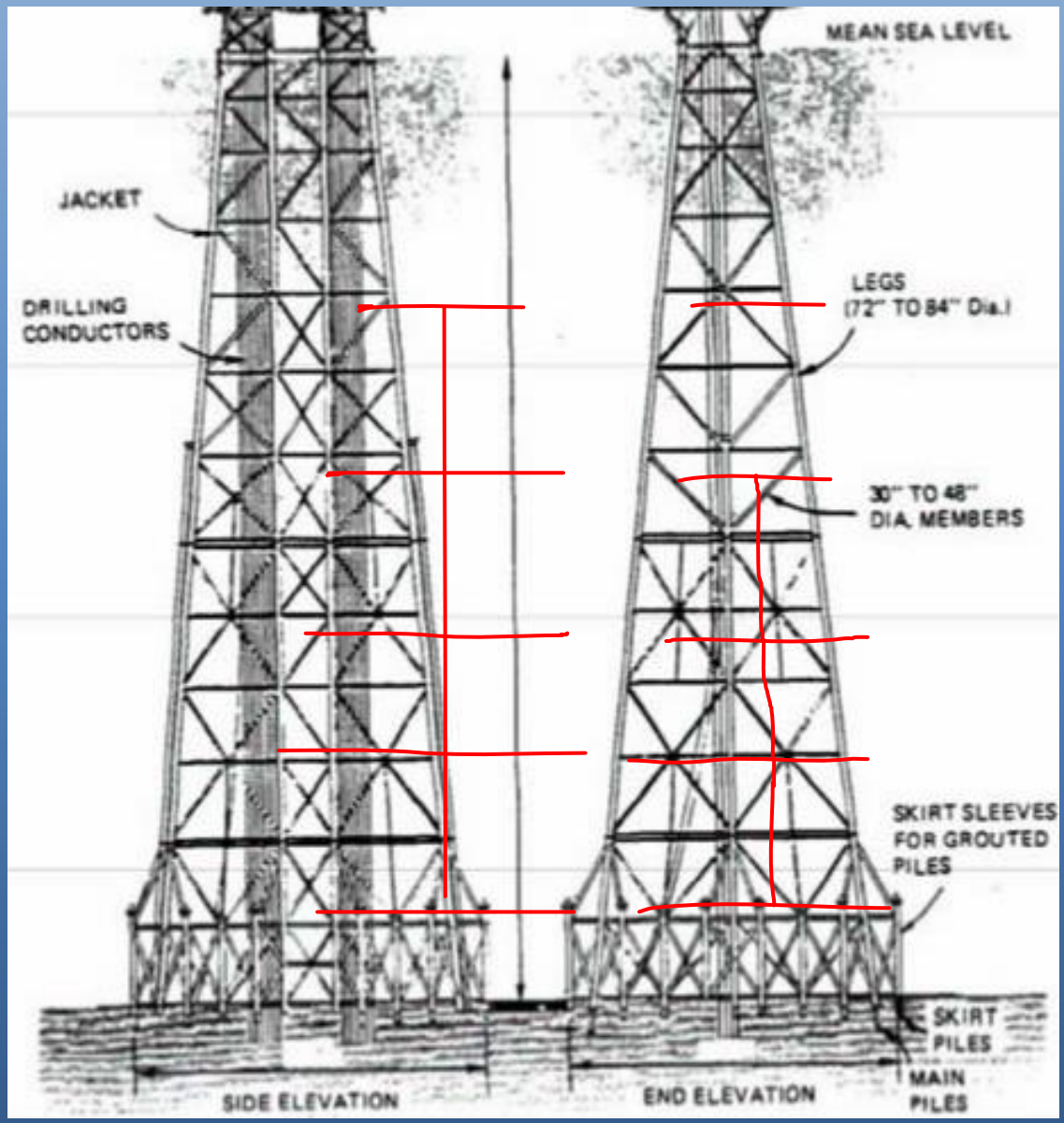
Platform (Jacket & Deck) Removal

Platform (Jacket & Deck) Removal

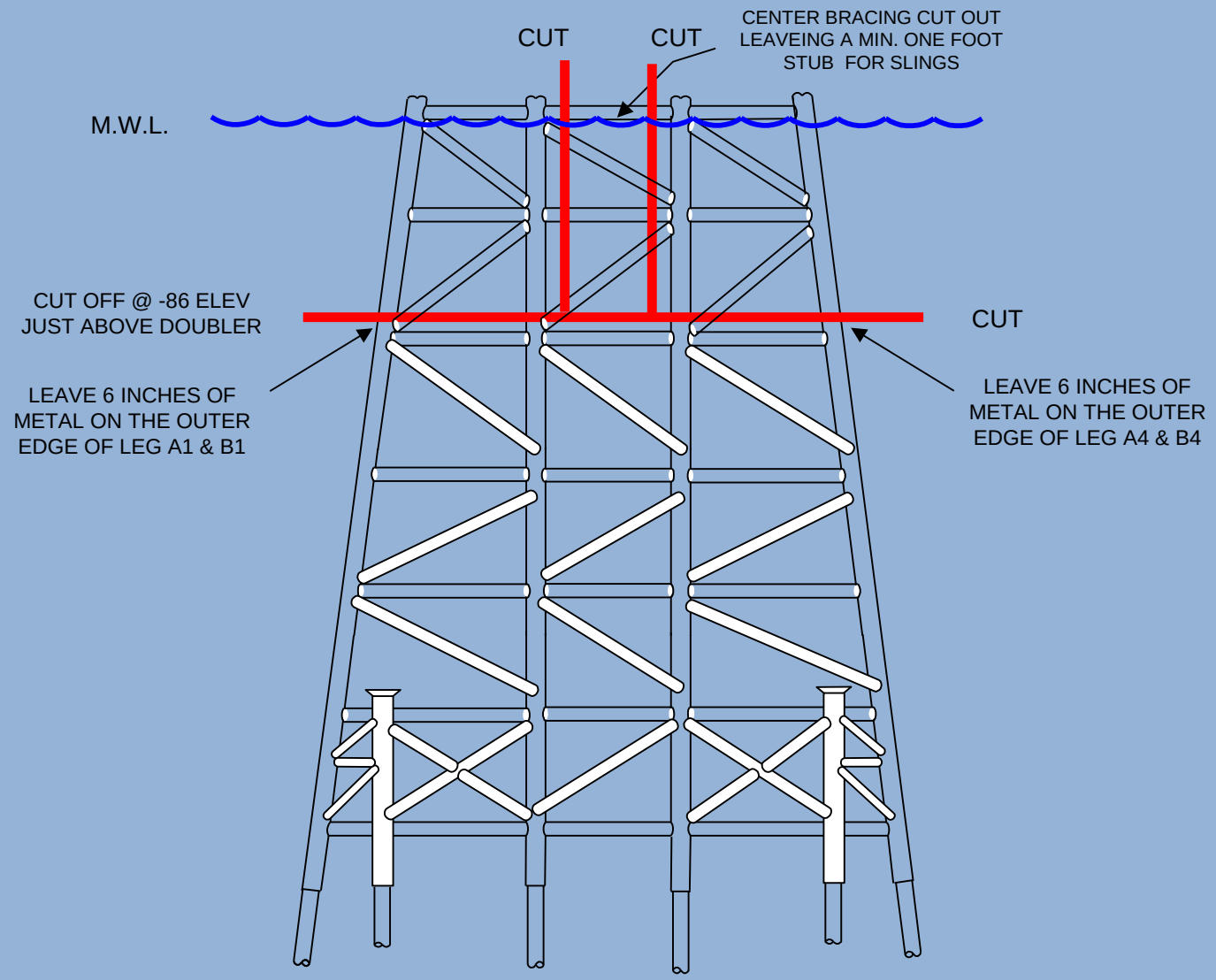
Large Jacket Complete Removal

Jacket and Pile Removal

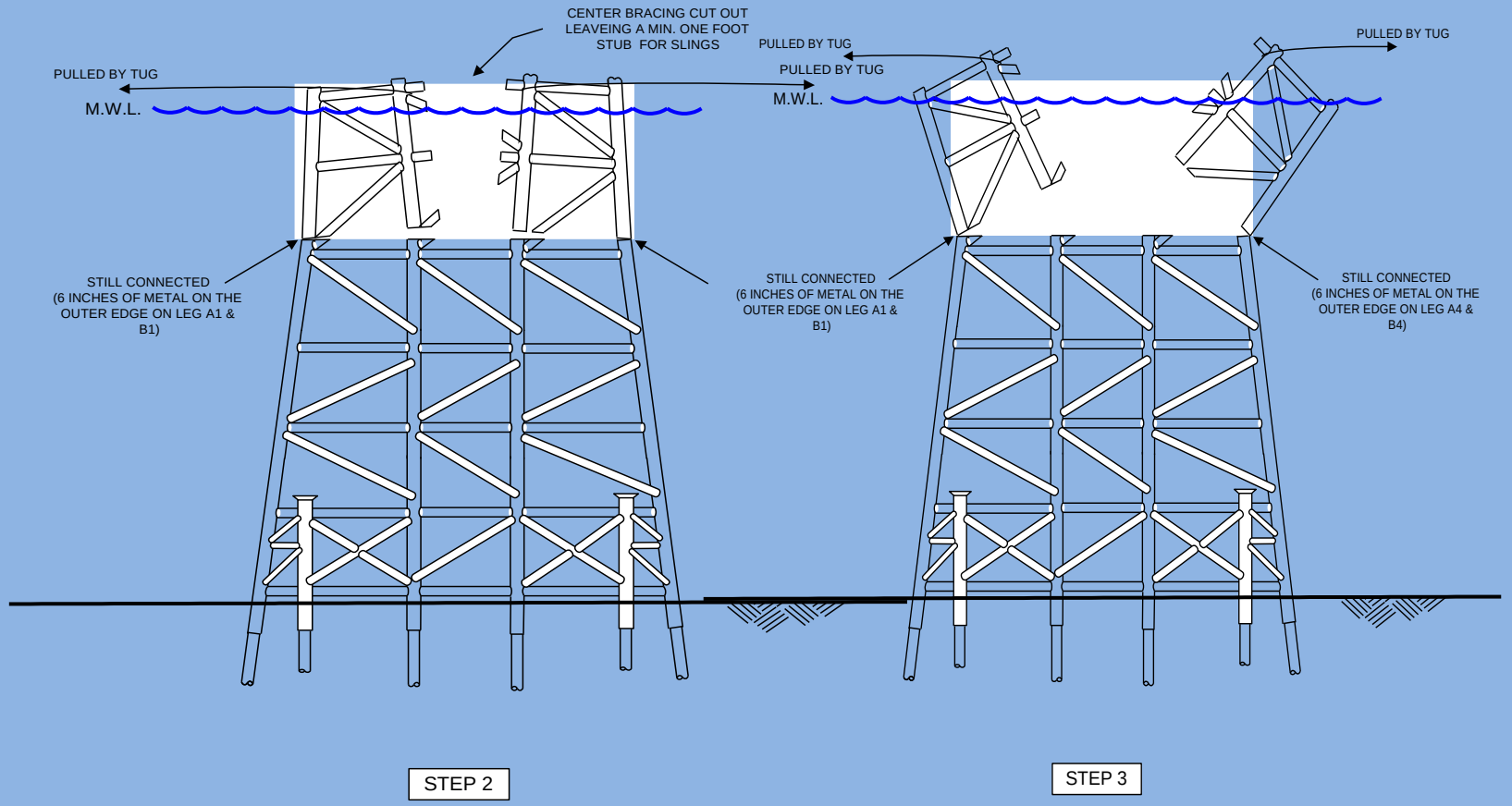
- Abrasively sever piles 15ft below mud-line
- Removed in one piece or cut into sections small enough (40-50% of full crane capacity) for the DB crane to remove safely and efficiently
- Transport to shore via cargo barge



Jacket Reef In-Place

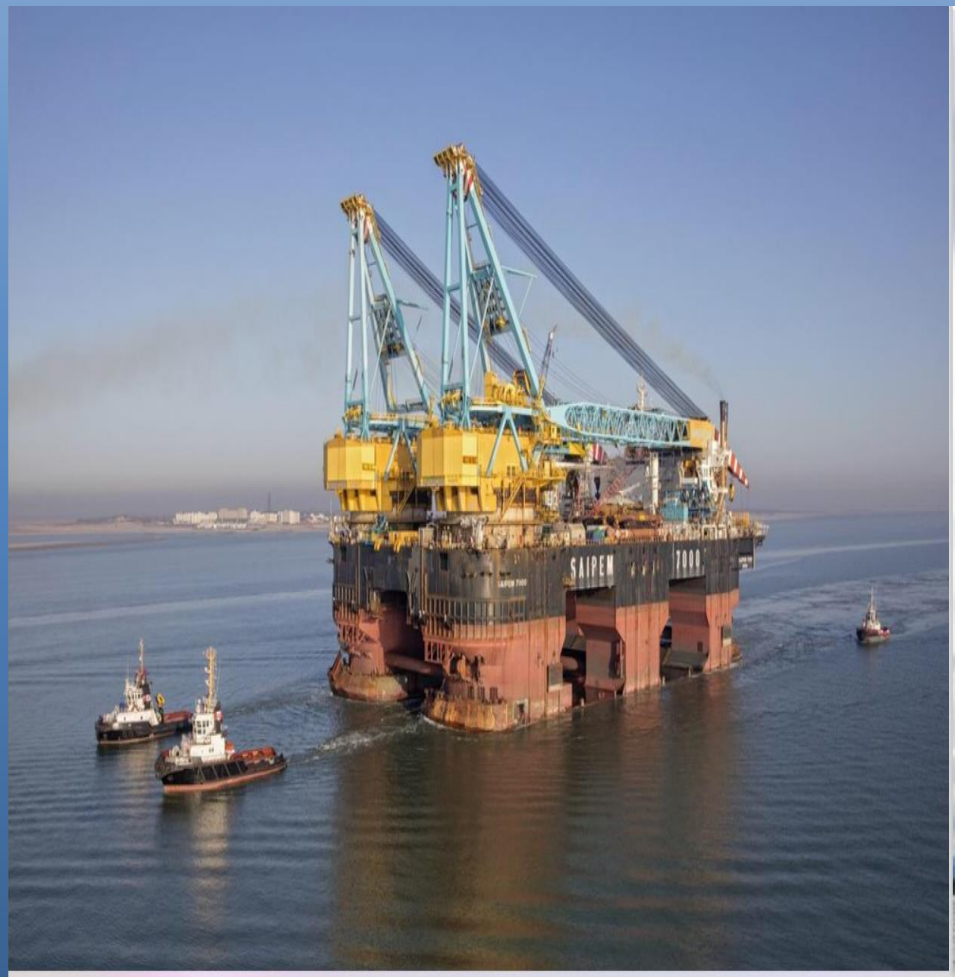


Jacket Reef In-Place



Hermod and Balder Semi-submersible Crane Vessels

SAIPAN 7000 & THIALF HLVS

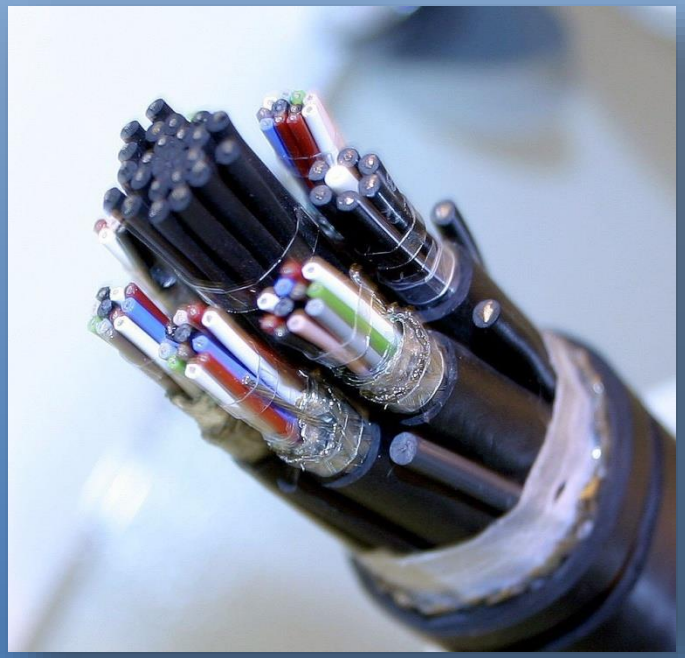


Pipeline Decommissioning

- Full Removal from <200ft WD to State Tidelands Boundary Only For Pipelines Running to Shore
- Cut, Plug and Bury Ends on Pipelines Running from Platform to Platform and Pipelines in >200ft WD That Run to Shore
- Pipelay Barge Method Too Costly for Short Pipelines
- Dive Vessel and Crane Barge Sectioning Method
  - ROV or Diver Retrieval
  - Sectioned on Crane Barge
  - Cargo Barge Transport to Shore

Power Cable Removal

- Full Removal to State Tidelands Boundary
- Workboat Sectioning Method Preferred:
  - ROV Retrieval
  - Sectioned on Workboat
  - Cargo Barge Transport to Shore

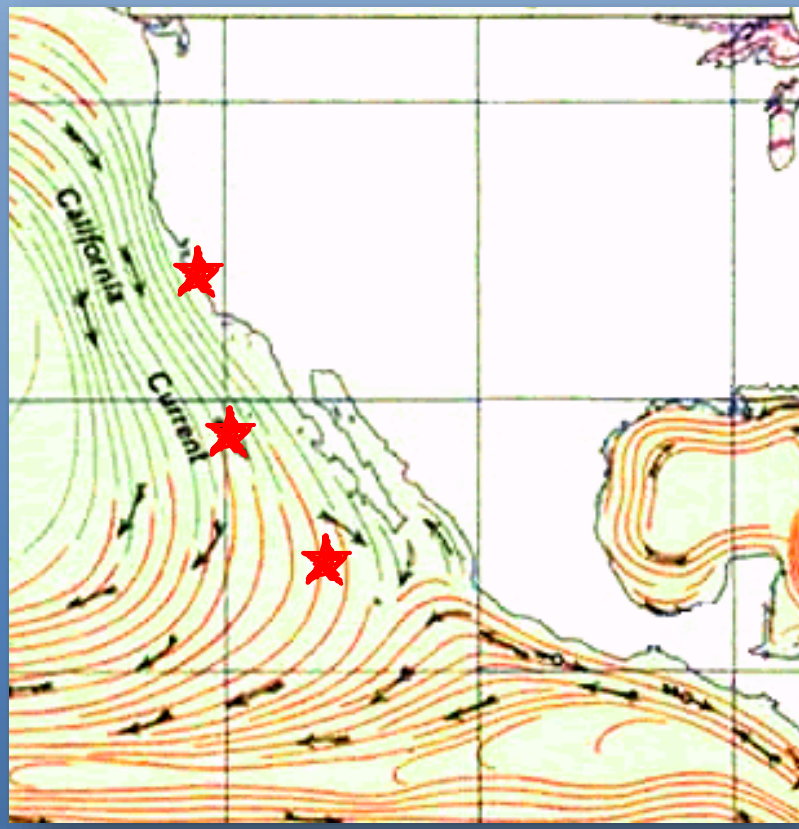


Materials Disposal in California

- Structures
  - Large Capacity Facility Required
  - Processing and Disposal at LA / Long Beach Facilities for Small Platforms Only
- Conductors, Pipelines & Power Cables
  - Small Scale Capacity Facility
  - Truck and Dispose of Inland Near Bakersfield, CA

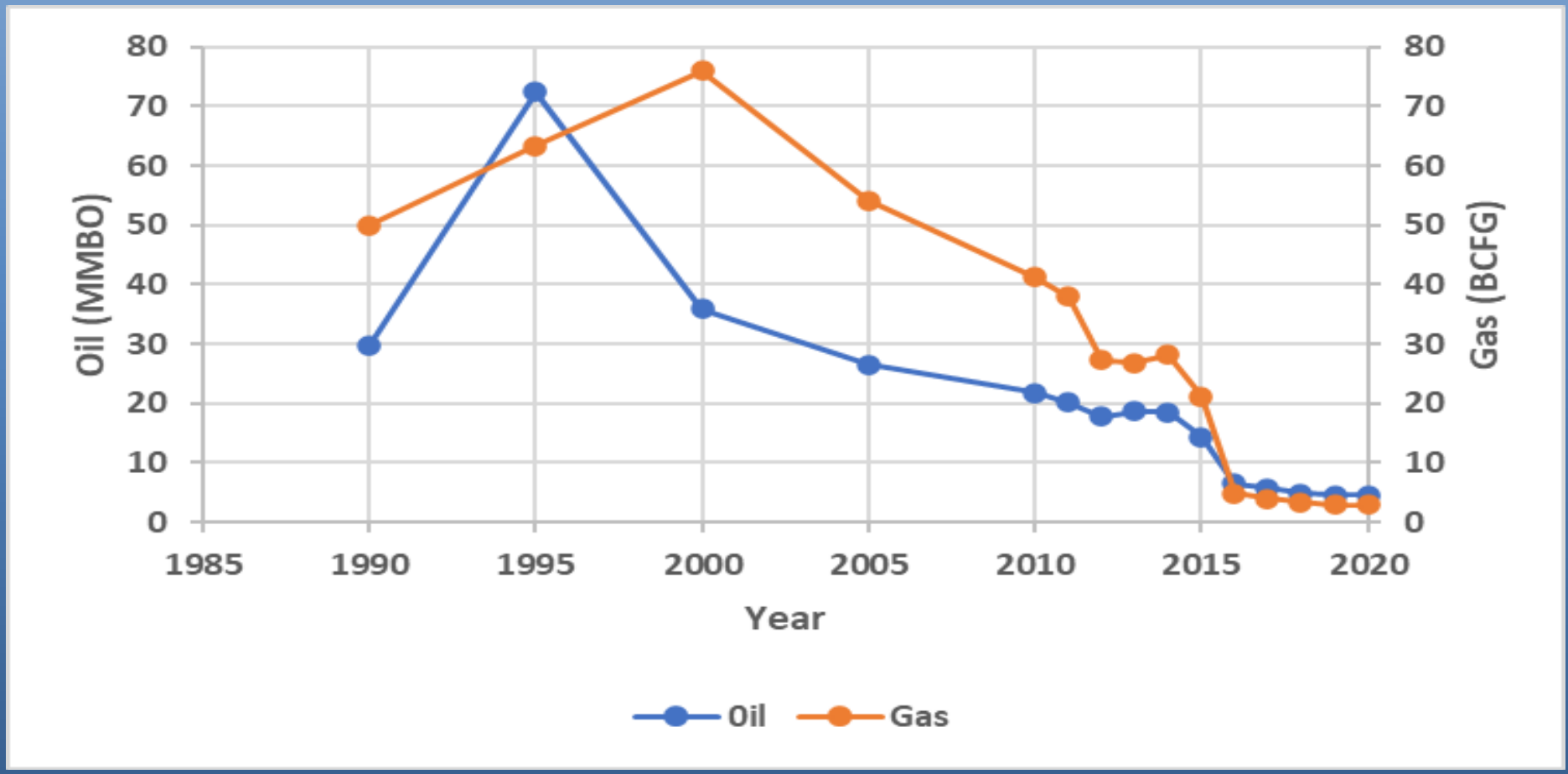
Materials Disposal for Complete Removal (Chevron Study)

- Schnitzer Steel - Portland, OR
  - Only facility on the West Coast capable of taking the 5 large platforms
  - Required approximately 350 acres on shore-front
  - Fight a 0.5 kt counter flow current
  - Superfund Site
- SA Recycling -
- LA/Long Beach Facilities
  - Nearest Location
  - Best Option from a liability standpoint
  - Very limited capabilities
  - Could not take the larger platforms
- Baja Peninsula, Mexico
  - Travel with 0.5 kt current
  - Cheaper, but more liability and no guarantee of availability
  - Green field site (no existing facilities)

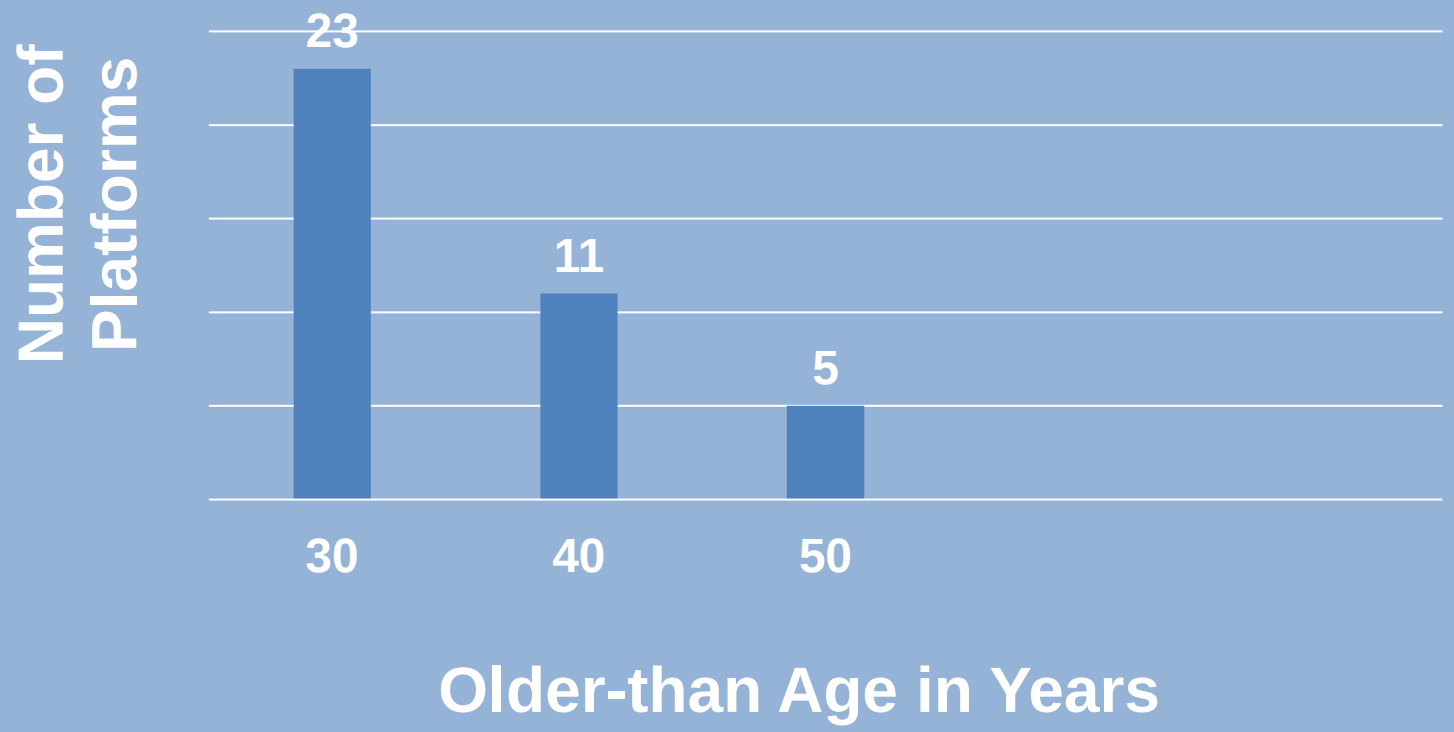


CALIFORNIA OIL AND GAS PLATFORMS

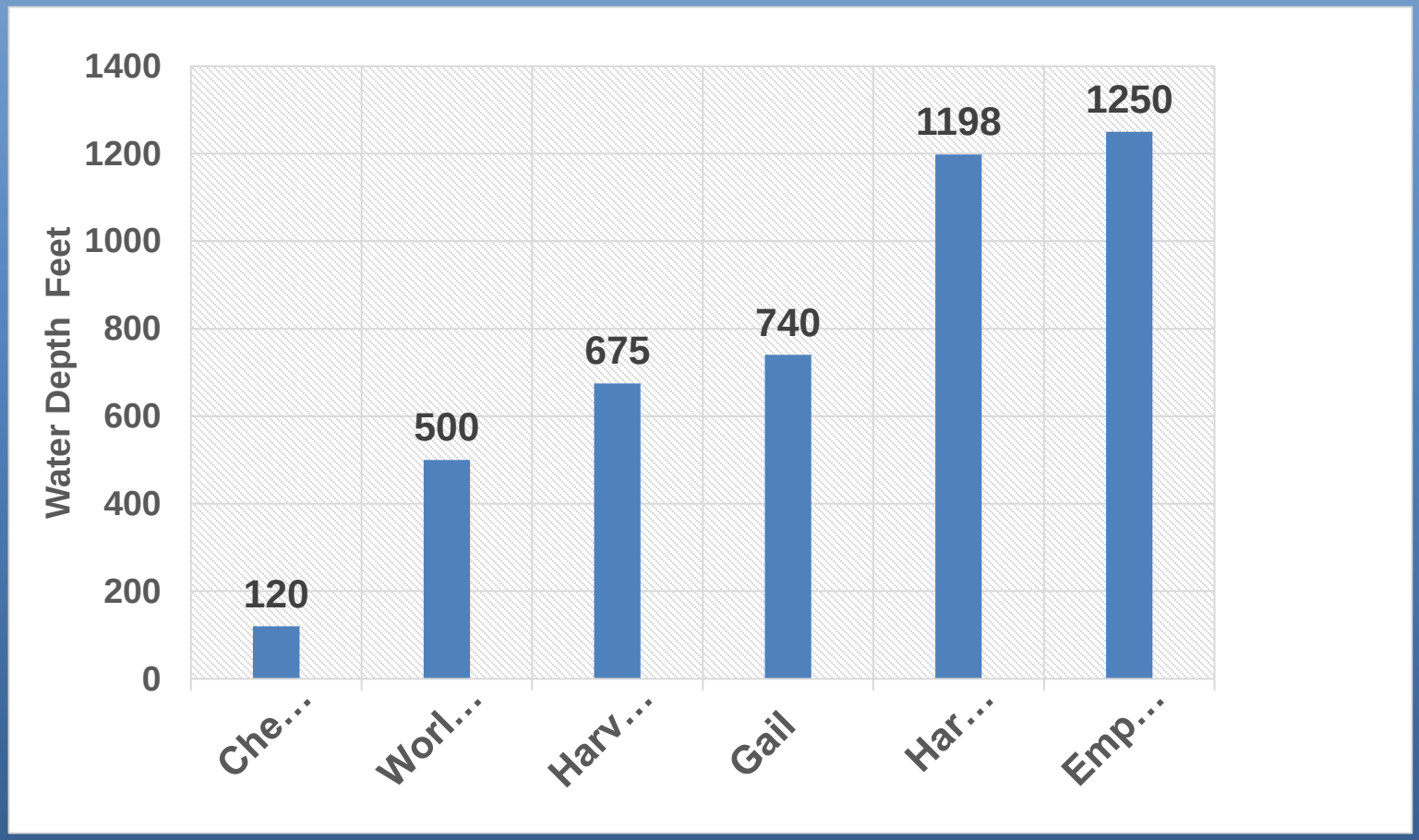
CALIFORNIA OCS OIL AND GAS PRODUCTION 1990 - 2020



RANGE IN AGE OF OCS PLATFORMS



JACKET SIZE COMPARISON



FEDERAL OCS PLATFORMS LOCATED OFFSHORE CALIFORNIA

Platform	Year Installed and Age (years)		Operating Status 1st Qtr. 2022	Water Depth (feet)	Estimated Removal Weight (short tons)	Wells	OCS Operator[1]
San Pedro Bay – Los Angeles County							
Eureka	1984	36	Shut-in	700	33,377	50	BOC
Elly[2]	1980	40	Shut-in	255	9,400	0	BOC
Ellen	1980	40	Shut-in	265	11,655	63	BOC
Edith	1983	37	Shut-in	161	8,556	18	DCOR
Eastern Santa Barbara Channel – Ventura and Santa Barbara County							
Hogan	1967	53	Shut-in	154	5,098	39	BWEG[3]
Houchin	1968	52	Shut-in	163	5,615	35	BWEG[3]
A	1968	52	Producing	188	4,896	52	DCOR
B	1968	52	Producing	190	4,959	57	DCOR
C	1977	36	Producing	192	5,718	38	DCOR
Henry	1979	41	Producing	173	4,006	23	DCOR
Hillhouse	1969	51	Producing	190	5,834	47	DCOR
Gina	1980	40	Producing	95	1,380	12	DCOR
Gilda	1981	39	Producing	205	11,293	63	DCOR
Habitat	1981	39	Shut-in	290	9,611	20	DCOR
Gail	1987	33	Shut-in	739	37,057	27	BWEG[4]
Grace	1979	41	Shut-in	318	13,074	28	BWEG[4]
Western Santa Barbara Channel – Santa Barbara County							
Hondo	1976	44	Shut-in	842	29,478	28	XOM
Harmony	1989	31	Shut-in	1,198	86,513	34	XOM
Heritage	1989	31	Shut-in	1,075	69,192	48	XOM
Santa Maria Basin – Santa Barbara County							
Harvest	1985	35	Shut-in	675	35,150	19	FMC
Hermosa	1985	35	Shut-in	603	30,868	13	FMC
Hidalgo	1986	34	Shut-in	430	23,384	14	FMC
Irene	1985	35	Producing	242	8,762	26	FMC

OCS DECOMMISSIONING PROJECTS

Platform	Water Depth (feet)	Estimated Removal Weight (s. tons)	Wells	Operating Status 1st Qtr. 2022	Current Operator	Major Companies Holding Decommissioning Obligations
Ongoing Platform Decommissioning Projects						
Gail	739	37,057	27	Shut-in	BWEG	Chevron
Grace	318	13,074	28	Shut-in	BWEG	Chevron
Harvest	675	35,150	19	Shut-in	FMC	Chevron/FMC
Hermosa	603	30,858	13	Shut-in	FMC	Chevron/FMC
Hidalgo	430	23,334	14	Shut-in	FMC	Chevron/FMC
Other Platforms Ordered to be Decommissioned by BSEE						
Habitat	290	9,611	20	Shut-in	DCOR	DCOR
Hogan	154	5,098	39	Shut-in	BWEG	ConocoPhillips
Houchin	163	5,615	35	Shut-in	BWEG	ConocoPhillips

CALIFORNIA DECOMMISSIONING CHALLENGES

1. Large structures and limited deep-water experience in the Industry.
2. Lack of local infrastructure
3. Very high HLV/DB mobilization costs.
4. Limited onshore processing & disposal options.
5. Problematic rigs-to-reef legislation.

LIMITED ONSHORE DISPOSAL OPTIONS

- SA Recycling Facilities in Long Beach
- Primarily processes industrial scrap (autos, rail cars)
- Limited capacity and crane capability
- Chevron 4-H platforms (10,000 tons)
- Gail/Grace Project (50,000 tons) (5 x Chev. 4-H)
- Pt. Arguello HHH Project (90,000 tons) (9 x Chev. 4-H)
- Major upgrades/capacity expansion
- Environmental Effects: Air emissions, Envir. Justice, etc.

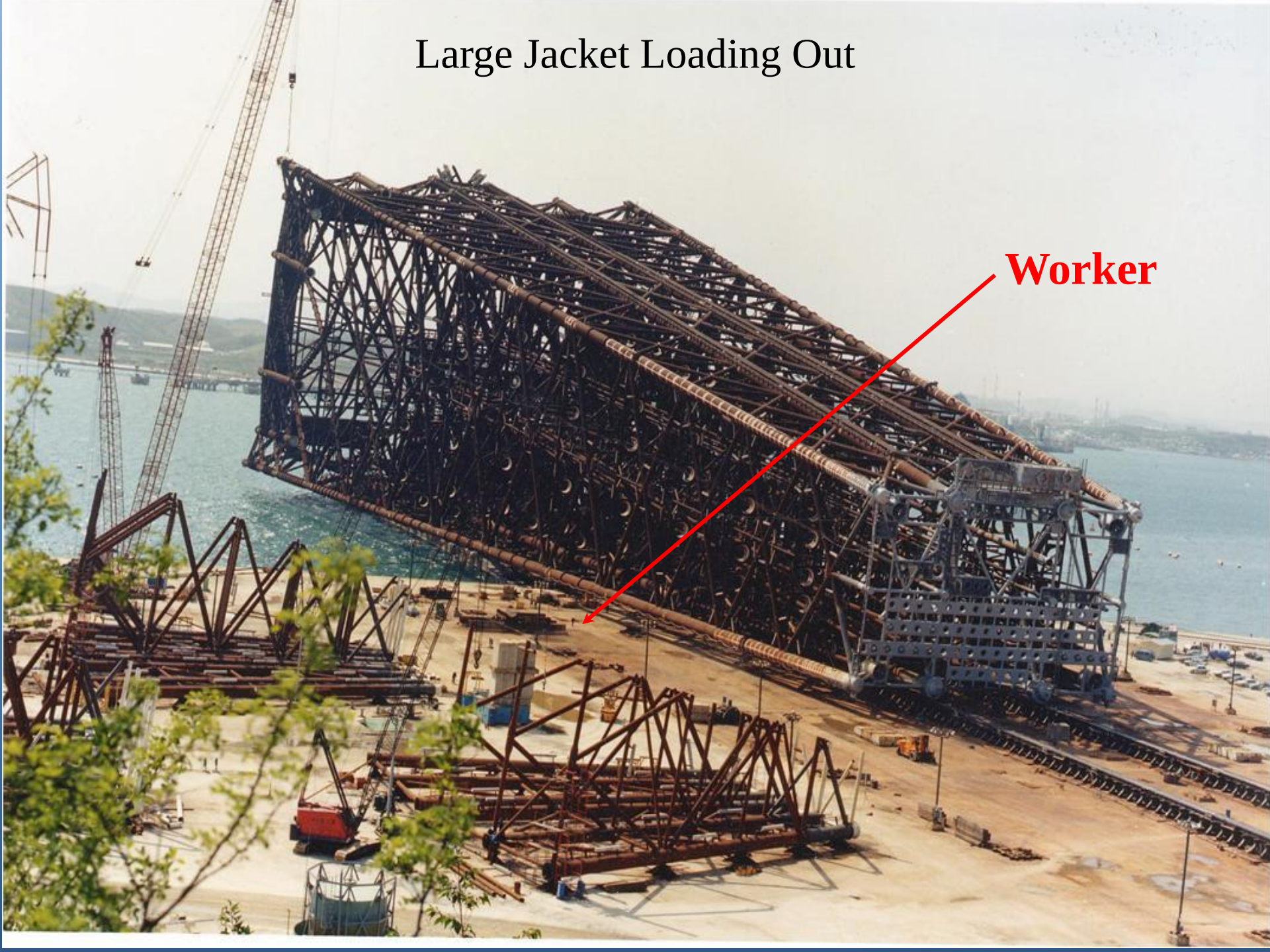
REEFING CHALLENGES

1. CA Marine Resources Legacy Act (AB 2503) of 2010
2. Considered unworkable by industry due to:
   - Liability concerns (perpetual)
   - High-cost share 65% until 2023, then 80%
3. Lack of a CA Artificial Reef Program
4. Under OCS regulations, platforms can be reefed if:
   (a) Structure becomes part of State Artificial Reef program,
   (b) The State accepts liability, and
   (c) ACOE issues a permit.

SUMMARY OF KEY POINTS

- Many OCS platforms have reached or are approaching the end of their economic life.
- Between 2025 - 2030 at least 10 platforms are projected to be decommissioned.
- Upcoming projects will be world-class in scale.
- Full removal will present major engineering, environmental, and material disposal challenges.
- Reefing of jackets would reduce challenges but is problematic absent amendments to AB 2503.

Large Jacket Loading Out



Questions?