OTEC System

Path to Commercial OTEC Plants

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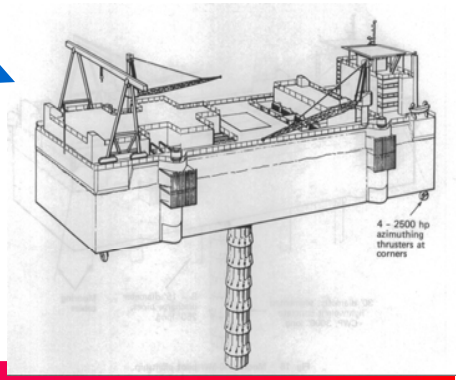
Path to Commercial OTEC Plants

Mini-OTEC to OTEC-1 to OTEC Plants/Plantships



OTEC System: Path to Commercialization

Then and Now

Then

- Power Only
- Shell and tube HXs

Now

- Power and desalinated water
- Plantships
- Commodity products

OTEC System: Path to Commercialization

1. What are the performance metrics that must be demonstrated prior to commercial development?
   - Predicted net power generation - kWh/yr
   - Total Installed Costs (TIC)
   - Dynamic performance of the OTEC power system to ocean conditions – seawater pumps, heat exchangers, and turbines
   - Impact of individual component on the performance of total system
   - Dynamic responses of the total platform, cwp and attached structures under different sea conditions

OTEC System: Path to Commercialization

2. What is the development time frame for a commercial OTEC system?

   - Less than five years after pilot plant demonstration.

   Key Factors:

   a. Costs projections for a commercial plant

   b. Strategic design approach for scale-up to a commercial plant

   c. Justifiable design approach to reduce the TIC

   d. Component/subsystem vendors part of the design team

   e. Demonstrated capability of the system integrator

OTEC System: Path to Commercialization

3. What are the potential failures that could lead to the shutdown of an OTEC system?

- Major mechanical failure in deployment or early operational phase (Do not lose CWP please)
- Major leak of the working fluid
- Uncontrollable dynamic behavior of the power system – seawater pumps, heat exchangers, and turbine
- Unexpected corrosion of aluminum heat exchangers
- Unexpected high rates of warm water fouling that cannot be controlled with acceptable level of chlorination

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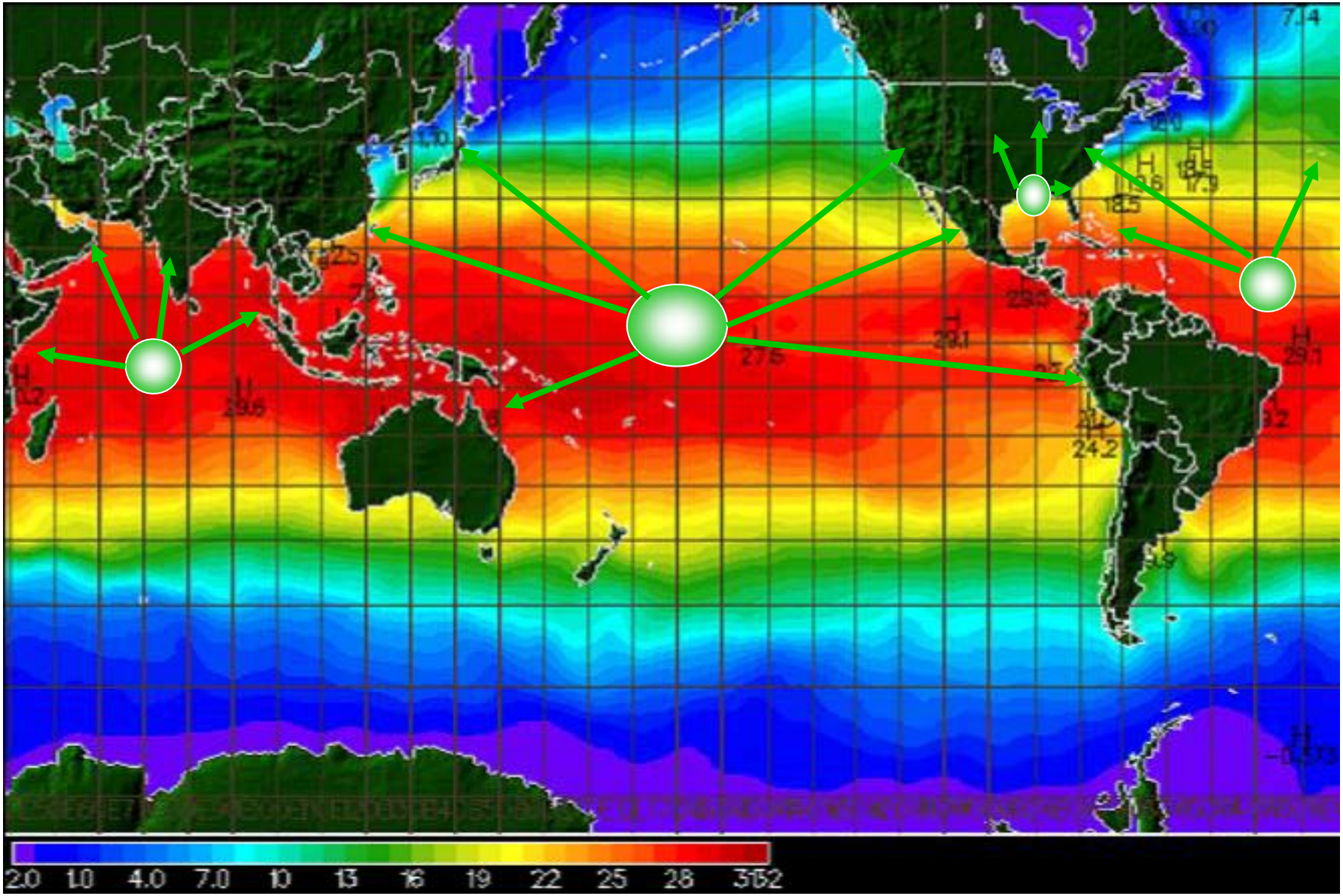
4. What processes/diagnostics are needed to detect, monitor and reduce these risks?
   - Performance monitoring of heat exchangers
   - Corrosion monitoring of aluminum heat exchangers
   - Potential change of fouling characteristics of warm water, so that chlorination schedule can be adjusted as preventive methods rather before significant fouling can occur
   - Dynamic responses of CWP (Good idea to know position of the other end of the CWP with respect to the top end)

OTEC System: Path to Commercialization

5. What are the flexibilities in the OTEC system's components that could minimize environment impacts?

   - Not sure about this question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