Technology Needs For Commercial Production of Hydrates Emrys Jones Hart Meeting 5-6 December 2006

Questions that need Answers Before Producing Hydrates

- Where are the deposits?
- How much?
- How do we drill it?
- How do we complete it?
- What are the flow rates?
- What production equipment is required?
- How do we get the gas to market?
- What do we do with the associated fluids?

Where and How Much

- Seismic analysis of hydrate deposits is developed to point where we can predict with reasonable accuracy the location and concentration of some hydrate deposits.
- More needs to be done to improve the quantification of the deposit and also to locate hydrates that are not in conventional horizontal deposits.
- LWD seems to provide accurate measurement of formation properties.
- Collecting pressure core samples for testing and verification of hydrates is needed.

Drilling

 Drilling is for the most part well established. However, care must be taken when drilling through a hydrate layer.

Well Completion

- Well completion for hydrate production has not been address.
- Some of potential problems are
 - Sand control
 - Hole stability

Flow Rates

- Reservoir models have been developed and limited testing completed. However, more tests and data on reservoir properties and performance is required before acceptance of model predictions.
- A production test will be required to gain confidence in models.

Production Equipment

 Modification of current production equipment for use in hydrate production seems likely.

Gas to Market

 Hydrates need to be located near existing facilities or the cost to prove hydrate production will be too large.

Associated Fluids

- Water disposal
- Other environmental concerns