Consultation Service Specification on "Survey for Treatment Technology of Carbon-dioxide and Associated Gas"

October 2nd, 2006
Japan Oil, Gas and Metals National Corporation (JOGMEC)
Oil & Gas Survey and Technology Group

1. General

This specification applies to the work titled "Survey for Treatment Technology of Carbon-dioxide and Associated Gas" mandated to the consultant. The consultant is required to submit the proposal documents mentioning work procedures covering all scope of work specified by JOGMEC.

2. Objective of the work

In order to supply useful information for the industry, treatment technology for carbon dioxide (CO2) and associated gas from various kinds of view, such as characteristics, cost and outstanding items are surveyed.

3. Investigation Scope

3.1 Trend Survey for CO2 Treatment Technology

3.1.1 CO2 Separation Process

The consultant shall investigate outline of the CO2 separation process used in E&P industry and shall summarize their process description, applied range, cost and so on. The targets are produced gas and associated gas with CO2 of 0 – 30% and of 30 – 70% having some pressure.

For process outline, the consultant shall report their process block flow, required energy, their characters, their licensor and so on. For example, the process shall be categorized from the view point of CO2 condense, temperature and pressure, separation type. For each process, the consultant shall investigate and report its operational characters and capable range in 2D graph (Fig. 1), and consider the pros and cons.

The consultant shall also list up another CO2 separation process used in other industry not E&P, and consider if the listed processes have capability to apply to E&P field. Also hurdles to the E&P shall be shown.

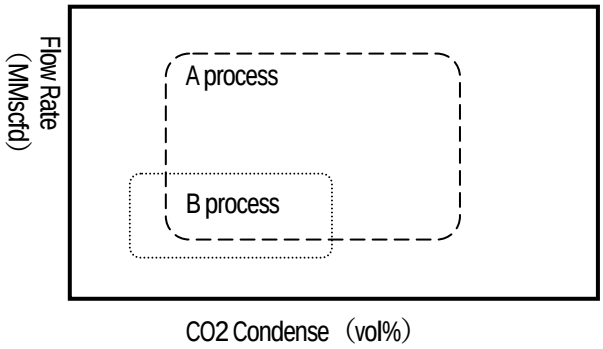

Fig.1 Example of 2D graph

(Lists of investigation process)

- ADIP Shell
- A-MDEA UOP
- Benfield UOP
- CO2 Recovery ABB
- Membrane
- SELEXOL UOP
- Sulfinol Shell
- Ceramics
- Others another less than 3 process (not used in E&P industry)

3.1.2 Technical outstanding items

For the processes listed in 3.1.1, the consultant shall list up their technical outstanding items, such as process condition (temperature and pressure), corrosion, fluid regime, life and energy assumption.

3.1.3 Sequestration, Utilization, Abandonment Techonology

The consultant shall survey sites or systems suit for CO2 sequestration and list up estimated possible amount of CO2 sequestration of some of hugest field and field names, sorts of system or structure for CO2 sequestration and outstanding items such as monitoring, operation of CO2 compressors, riser system for offshore storage and dispersion and/or leakage from system from long term view points.

The consultant shall list up means of CO2 monitoring for geo-sequestration.

For CO2 utilization, envisaged potentiality of food industry and bio-chemical industry, the consultant shall survey amount of CO2 utilization per year, fluctuation of CO2 demands. The consultant shall also list up outstanding items in those categories.

3.1.4 Transportation, Storage Technology

The consultant shall investigate storage tanks for gas and liquid CO2 from capacity view point. The consultant shall also survey technology around tanks such as loading/off-loading, safety, maintenance, operation and control.

For transportation technology, the consultant shall survey technology required for it and compare with those used in hydrocarbon transportation.

3.1.5 Cost

The consultant shall investigate CAPEX and OPEX in CO2 separation, sequestration and utilization and calculate its unit cost with its calculation conditions. License fee also be surveyed but not require too accurate order. The consultant shall also list up vendors and engineering company considered to have enough capability for CO2 technology with their contact points.

The cost shall be analyzed in relation between CO2 condense and inlet flow rate to the process in order to understand cost efficiency and be able to compare each others.

3.1.6 Case Study

The contractor shall study three (3) case studies, such as Sleipner, Gorgon project. These cases shall be decided based on discussion with JOGMEC.

In those case studies, the consultant shall investigate the company policy, philosophy and future vision who run or plan the CO2 sequestration.

3.1.7 R&D Trend

The consultant shall survey CO2 separation technology under R&D road and their position in the R&D road.

3.2 Trend Survey for Associated Gas Treatment Technology

3.2.1 Associated Gas Development Concept

The consultant shall categorize concepts to monetize stranded gas or small gas without infrastructure around them.

3.2.2 Associated Gas Recovery Technology

The consultant shall categorize associated gas recovery from field streams, especially having low pressure. Subsea processing technology shall be included.

3.2.3 Utilization Technology

The consultant shall survey associated gas utilization technology, such as power generation, EOR, gas lift etc, and concept taking account field situation into.

3.2.4 Cost

The consultant shall investigate CAPEX and OPEX in associated gas utilization and calculate its unit cost with its calculation conditions. License fee also be surveyed, if required, but not require too accurate order. The consultant shall also list up vendors and engineering company with their contact points.

The cost shall be analyzed in any way proposed by the consultant in order to understand cost efficiency and be able to compare each others. The analyzing way shall decided with JOGMEC

3.2.5 Case Study

The contractor shall study three (3) case studies. These cases shall be decided based on discussion with JOGMEC.

In those case studies, the consultant shall investigate the company policy, philosophy and future vision who run or plan the associated gas utilization technology.

3.2.6 R&D Activities

The consultant shall survey associated gas utilization technology under R&D road and their position in the R&D road.

3.3 Presentation

The consultant shall present the output from this survey in the presentation meeting held by JOGMEC in Tokyo aiming at the industry's engineer. The presentation time shall be within two (2) hours.

4. Deliverables

4.1 Bidding Stage

The consultant shall submit three (3) sets of proposal.

4.2 Survey Stage

After successful bidding, the consultant shall submit one (1) set of cost estimation for this scope.

During the Survey Stage, the consultant shall report the status of the work in simple format by e-mail or fax.

The consultant shall submit one (1) set of full report which includes electrical data JOGMEC can edit after JOGMEC's approval.

5. Term

The work should be completed before 28th February, 2007 or the date the consultant proposed.

6. Others

6.1 Kick off Meeting

The consultant shall discuss the survey philosophy, detail scope, etc with JOGMEC, TRC in Chiba, Japan before starting the survey.

6.2 Existing Information

The consultant shall utilize the existing public information on the CO2 and associated gas technology, such as by IPCC (Intergovernmental Panel on Climate Change), RITE Japan.

6.3 Copy Rights

The consultant shall put the sources of drawings, pictures, tables in the reports to avoid the copy rights conflicts as JOGMEC will have this survey output be public. The consultant shall get the permission from right holders if required.

6.4 Other

The consultant shall follow the instruction from JOGMEC in aspect of not mentioned in this specification.

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