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## Licensor Technology Selection

*By Jerry Lacatena*

Proper refinery or process facility planning often necessitates the use of third-party licensed technology to enhance the client's project objectives, which typically target optimized performance, safe and reliable operation, and maximized profitability. Most selections are typically handled as separate technical and commercial evaluations by experienced staff proficient in that area.

It is essential to have the plan in place when starting to determine what licensed technology should be utilized in specific applications, which would likely be after initial configuration planning studies are conducted. As such, primary process requirements, basic project data, and economic information are presumed to be readily available. This overview endeavors to discuss a fundamental approach that can be applied to technology selection activities. A technology selection plan typically may consider:

- Identifying the basis and target objectives of the process unit for the purposes of inquiry, and the pertinent technology providers of interest
- Understanding the client's criteria, deliverable requirements, preferences, etc., and applying these to establish prioritized methodology for evaluation/selection reporting
- Soliciting licensor technology package proposals/information in the name of the client, with clear instructions and definition of deliverable content and timing
- Evaluating licensor proposals for the purpose of selection
- Reporting technical and commercial analysis

The licensor inquiry should include the design basis tailored to the type of processing technology of interest and timeline available for selection, recognizing that the more information that is asked for, the more time will be required by providers to supply and eventually to assess. Below are some typical questions and considerations only for illustration:

- Does the licensor proposal confirm the technology offered will meet all performance objectives set forth? What product yields/qualities are produced? Is the technology flexible with regard to capacity turndown requirements and potential feed impurities?
- Is the technology commercially proven and reliable? Where is it currently operating in facilities of similar service and capacity? Have there been any historical problems? Is the technology mature, improving, or a first-in-kind prototype? Note that prototypes usually require more in-depth assessment before selection and may follow a somewhat different path and timeline than covered by this article.

## Work Highlights

### *Process, Operations & Safety*

- *Supporting multiple pilot plant research efforts on reactor radioactive tracer testing, including data analysis.*
- *Continuing to provide facilitator and designer support on numerous HAZOP, project safety review, and Transient Operations HAZOP (TOH) efforts at many locations and clients for a variety of refinery and chemical plant units.*
- *Assisting a licensor with process engineering consulting for an FCCU Optimization Study being done for an overseas refinery. The study includes development and review of baseline data, and then projection of the results for various other operations. It is anticipated that support will be provided later on the implementation of recommended design improvements.*

### *Project Management*

- *Cost estimating consulting support provided to major chemical company to support their new process R&D efforts. The results of this work will help them determine the most appropriate of several options to pursue considering their relative costs.*

- What operating conditions and process configuration is proposed by the licensor? It is prudent to ask for a preliminary sized equipment list, process schematic, and a conceptual cost estimate. Recognize that licensor estimates should be verified separately and that it is important to pay attention to what is specifically excluded so comparisons can be reconciled.
- What does the licensor include in his standard technology package? Are there upgraded design packages with more information?
- In order to understand the economics of operating the unit in addition to the capital cost, the number of operators, utilities consumption and production, other chemical additives, catalyst, etc., and maintenance should be assessed to capture the overall financial scenario appropriately.
- If a catalyst is required, is it readily available by one or more vendors or require stringent process conditions? What is the projected run length and overall catalyst life? What affects the catalyst life?
- How much plot footprint will the unit require?
- Is the environmental impact of the unit well established? Are there waste streams or air emissions that need special attention, and if so, what are they?
- Is the technology inherently safe or have special features to ensure plant and personnel safety?
- Is the unit too complex to mechanically design or operate? Are there any long-lead procurement items?
- Does the licensor offer technical support in the event of technical issues or problems, operating procedures, training, and startup services, etc.?
- What are the advantages and disadvantages associated with the technology?

Follow-up dialogue and meetings with licensors can prove beneficial after receipt of their proposal to resolve outstanding questions, obtain missing information, and to better understand licensor claims indicating special advantages that set their technology above the competition.

In addition to capital cost and operating expenses, commercial interests also include the cost of engineering the technology package, any license fees/royalties, and other commercial terms. It would be beneficial to understand the provider's position on performance guarantees, which are usually set later at the time of contract. Guarantees are frequently considered of greater interest in less conventional applications, assuming specific liabilities are established upfront and a performance test run can be performed with a baseline feed.

If the overall selection process reveals that technical and economic comparisons are close on an overall basis, the ability of the technology provider to respond in a timely manner, flexibility to accommodate the owner's and/or contractor's work process, and to deliver their package to meet overall project schedule should be considered.

A non-disclosure agreement may be necessary to get sufficient information to satisfy the inquiry, and as an option, the selection process may be performed by an unbiased independent party to ensure confidentiality of competing proprietary information. Carmagen has experts that can support the selection process and has done this for clients. The depth of screening can be influenced by the extent of criteria, importance of certain parameters to commercial project success, and of course the technology performance. Both technological and commercial areas need attention and are recommended to be explored prior to final technology selection negotiations.

#### About the Author

*Jerry Lacatena has over 35 years of process engineering experience in a broad range of design applications and technologies. He is a proficient and organized multi-tasker, having extensive plant design experience on numerous revamp and grassroots projects throughout the world, with projects ranging from feasibility studies, technology evaluation, FEED, EPC development, to plant performance testing. Jerry has excellent presentation, communication, coordination, and interpersonal skills utilized to develop strong working relationships with team members, clients, vendors, sub-contractors, and technical licensors.*

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