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Iberdrola sells its assets in Mexico

Introduction: Early this month, we were surprised by the official announcement from the Mexican government, that Iberdrola would sell most of its assets in Mexico to CFE, the local power Authority. In this News Clip, we would like to analyze the case from an operational and risk-management point of view.

The Announcement

Following article from “Mexico News Daily” resumes the publication of the 5th of April 2023:

<https://mexiconewsdaily.com/news/iberdrola-to-sell-13-mexico-power-plants-to-govt/>

In a nutshell: In line with the political strategies of the Mexican government - increasing its control of the local energy market – an agreement was reached with the Spanish energy producer Iberdrola to buy 13 of its plants for US\$ 6 billion. According to the article, the purchase included 12 combined cycle power plants with a combined generation capacity in the range of 8.500 MW.

Due to its political content, the information triggered a huge amount of comments in local and international media, with a still on-going public discussions. Whether the purchase price of 700 US\$/kW was the right one, if it was in fact a nationalization of a private entity, if it was right to purchase second-hand plants instead of building new one, are examples a heated debate right now.

What we missed so far though, were comments with a more technical focus, i.e. the implications and consequences of a massive purchase of Combined Cycle Power Plants (CCPPs) on behalf of CFE – the local power authority - from a risk manager’s point of view. In the following sections we will try to share our view about some technical and operative aspects with focus on the complexity of operating a CCPP.

Technical Background:

In order to give the reader an understanding of the basic features of the 13 plants purchased by CFE or Mexico Infrastructure Partners (MIP), the special purpose vehicle created for the operation, we present the following diagram extracted from an official Government presentation:

Centrales Eléctricas de Iberdrola adquiridas para operación de la CFE

No.	Central Eléctrica	Ubicación	Capacidad (MW) Permisos CRE	Capacidad (MW) Interconexión CENACE	Tecnología	Fecha de inicio de operación comercial	Tipo de
1	Tamazunchale I	Tamazunchale, San Luis Potosí.	1,261 (PIE: 1,16; AUT: 100)	1,235 (PIE: 1,135; AUT: 100)	Ciclo combinado	Junio 2007 (16 años)	PIE y AUT
2	Tamazunchale II	Tamazunchale, San Luis Potosí.	532	514	Ciclo combinado	Mayo 2022 (1 año)	LIE
3	Altamira III y IV	Altamira, Tamaulipas.	1,214 (PIE: 1,153.7; AUT: 60)	1,102 (PIE: 1,042.4; AUT: 60)	Ciclo combinado	Diciembre 2003 (20 años)	PIE y AUT
4	Altamira V	Altamira, Tamaulipas.	1,223 (PIE: 1,143; AUT: 80)	1,201 (PIE: 1,121; AUT: 80)	Ciclo combinado	Noviembre 2006 (17 años)	PIE y AUT
5	Topolobampo II	Ahome, Sinaloa.	1,178 (PIE: 1,091; LIE: 87)	917 (PIE: 887; LIE: 30)	Ciclo combinado	Octubre 2019 (4 años)	PIE y LIE
6	Topolobampo III	Ahome, Sinaloa.	868	791	Ciclo combinado	Noviembre 2019 (4 años)	PIE
7	Escobedo (Noreste)	El Carmen, Nuevo León.	1,026 (PIE: 946; LIE: 80)	904 (PIE: 869; LIE: 35)	Ciclo combinado	Enero 2019 (4 años)	PIE y LIE
8	La Laguna	Gómez Palacio, Durango.	615 (PIE: 514; AUT: 101)	543 (PIE: 498; AUT: 45)	Ciclo combinado	Marzo 2005 (18 años)	PIE y AUT
9	Monterrey I y II (Dulces Nombres)	Pesquería, Nuevo León.	530	545	Ciclo combinado	Marzo 2002 (1 año)	PIE
10	Monterrey III y IV (Dulces Nombres II)	Pesquería, Nuevo León.	338	303	Ciclo combinado	Octubre 2016 (7 años)	AUT
11	Baja California	Ensenada, Baja California	333 (PIE: 303; LIE: 30)	324 (PIE: 294; LIE: 30)	Ciclo combinado	Enero 2017 (6 años)	PIE y LIE
12	Enertek	Altamira, Tamaulipas.	168	152	Ciclo combinado	Febrero 1998 (25 años)	COG
13	La Venta III	Juchitán de Zaragoza y Santo Domingo Ingenio, Oaxaca	102	102	Eólica	Marzo 2012 (11 años)	PIE
Total			9,388	8,633			

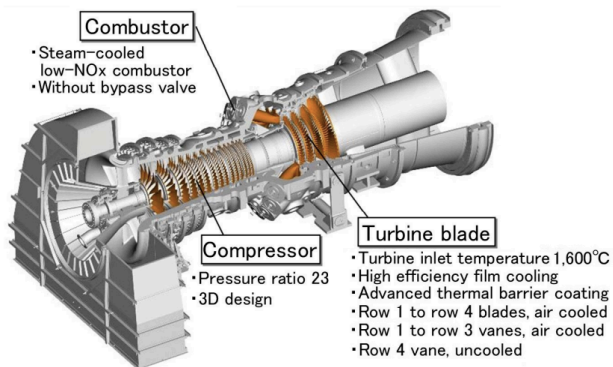
Item 1 through 12 are CCPPs while Item 13, an eolic plant, is the only renewable energy plant. We would like to point out the age of the plants, mostly with a CoD (commencement of operation) between 2002 and 2022. We take out of our considerations Item 12, ENERTEK, due to its age and the fact that it did not renew its operating permissions since of September 2022, being eventually disconnected from the grid by CENACE.

The nominal capacities reported to CENACE – the local dispatch agency – are between 300 MW and 1.235 MW, what indicates that several of the plants consist of different units or power blocks.

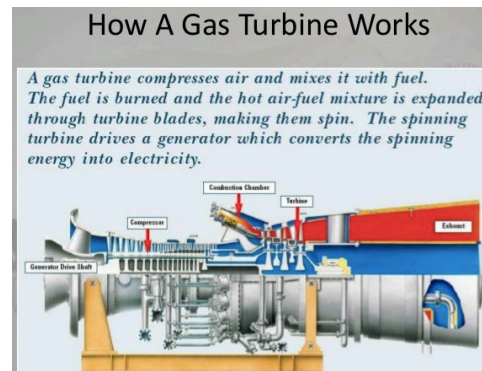
A more detailed research leads to the turbines operating in the CCPPs. From our research we can confirm that highly sophisticated gas turbines from well-known and reputable manufacturers like Siemens, General Electric, Alstom and Mitsubishi Hitachi Power Systems are installed in the plants. In some cases the same manufacturers supplied also the steam turbine. The configuration of the plants is a 1 x 1 x 1 for the older plants and a 2 x 1 x 1 for newer plants. Only the biggest CCPP in Tamazunchale has a 2 x 2 x 1 configuration (meaning 2 gas turbines, two heat recovery steam boilers (HRSG) and one steam turbine). As can be noted, only observing the major equipment involved in a CCPPs, shows with no doubt the complexity of the plant's equipment.

As a matter of fact, the Frame 7 gas turbines from General Electric or Siemens, or the M501J series from Mitsubishi, are technically highly complex equipment that is exposed to extreme temperatures as well as pressures, and, in order to step-up the nominal capacity, reaching always the limits of the technical feasibility. It should also be considered that a run to increase the plant's availability and reduce the maintenance stoppages form part of the on-going competition among the manufacturers. Up-grade packages are available for the combustion turbines from the original equipment manufacturer and are offered to the operators with the target keeping the equipment at a "state of art" condition.

Also the heat recovery steam generators (HRSGs) - equipment operating at high temperatures and pressures - require detailed routine maintenance activities, that are focused mainly on piping water leaks. And last not least, the SCADA operational systems, offered by different specialized providers, are subject to updates and modernization, focused on monitoring, among others, safety parameters of the different critical equipment.



M501J Mitsubishi Combustion Turbine



Heat Recovery Steam Generator



Inspections of CCPPs

From the afore-mentioned we should recognize that the operation of a CCPP is a technically sophisticated and challenging enterprise. Consequently, inspections on behalf of insurers of this occupancy are a routine activity, especially for reinsurers. The surveys are normally carried out by specialized inspectors, more familiarized with the energy business, than the basic engineering branches. The assessment of

- maintenance team and its routines
- relationship with original equipment manufacturers (OEMs) or – for older plants – certificated & recognized non-OEMs
- the plant's operative history, i.e. scheduled availability vs real availability, programed and unscheduled unavailability, load factors, CAPEX, among others
- experience and training of the operational team
- distributed control system (SCADA) and its up-grades and/or recent migrations
- fire prevention equipment, taking into account gas explosion explosion and large diesel tank protection, incl. its related pumping systems
- cyber risk prevention

require a certain expertise of the surveyor.

Based on our experience with CCPP inspections, for the purpose of this paper, we would like to add to the above specific local circumstances, like the saline environment in Altamira and possible corrosion of structures, the water treatment of sea water, a high personnel rotation due to the social environment in certain regions of Mexico, climatic changes in some regions that can have repercussions on water supply and related government concessions, and a higher frequency of hurricanes in the Gulf Area.

An important aspect to analyze are also the long term agreements in force with the suppliers of basic utilities (gas, diesel, emergency power in case of no black start abilities), and power purchase agreements with private industrial off-takers. On the same tune, related to Business Interruption, it is crucial verifying the stock of available spare parts within the plant or provisions in the LTAs or maintenance agreements with the OEM with respect of a time-conditioned delivery of major spare parts or equipment that have a long manufacturing lead time.

The afore-mentioned is exemplary and only a fraction of information needed for a 360° evaluation of a CCPP; it is meant just to show the complexity of a CCPP survey.



The Consequences for the Take-over of Iberdrola

CFE's suddenly taking over of the operational control of 12 CCPPs of Iberdrola can rise several questions, from the perspective of a risk manager. As per information of the press available at present, a special purpose vehicle (MIP), with CFE and FONADIN as majority shareholder, will be in control of the plants. It is not known yet how the long-term service agreements (LTAs) with the OEM will be honored, if the operative personnel of Iberdrola will be absorbed, and how the future maintenance programs will be managed. In view of the fact that some of the plants are reaching a critical point in their life time, where critical inspections need to be carried out, it is paramount following up that adherence to the OEM's recommendation is guaranteed.

Based on our experience with CCPP inspections owned by international private energy companies in Mexico, we can confirm that the maintenance standards are above the average compared to the antiquated CFE plants. Only first tier suppliers are involved, LTAs with the OEM are in force, OEM spare parts are in use, routinely equipment inspections and upgrades of major equipment are carried out by the OEM or renowned non-OEM service providers. Of course, industry-related loss events are part of the business, but the events are all analyzed and corrective actions, mostly based on OEM recommendations, are being taken.

Under the new administration, keeping up with the same standards, improving them and keeping the status of the plants "state-of-art", will certainly be a challenge, not only for the new operator but also for the insurance industry.

Disclaimer:

Please be aware that our news clip is based on information publicly available in news feed and internet. RISC did not inspect any of the plants subject of the Iberdrola sale. Our opinions expressed herein are personal and based on our experience carrying out surveys to similar CCPPs (construction and operation) in LA.