

PowerPlant Chemistry Interview

PowerPlant Chemistry talks with Dr. Victor Marcu, the senior chemist of the Israel Electric Corporation's (IEC) Orot Rabin power station, Hadera, Israel, and asks him some questions about the power plant and the chemist's functions in this utility.

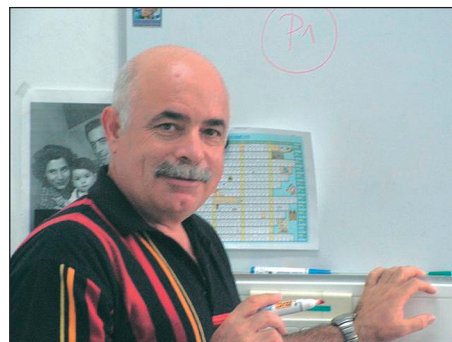
Victor, please give our readers a brief overview of your power plant.

Orot Rabin PS is the largest energy producing site in Israel. It is located at the midpoint of the seaside road that connects the ports of Haifa and Tel-Aviv. On site there are four 360 MW units commissioned in the early 80s (Units 1–4) and two 575 MW units commissioned in the middle of the 90s (Units 5–6), amounting to a total of 2 590 MW (about 25 % of the total installed capacity). The annual electricity production is around 19 million kWh (equivalent availability higher than 90 % and almost 40 % of total production). Both types of units burn almost exclusively bituminous coal. The drum boilers produce main steam of 13.5 MPa (Units 1–4) and 17.5 MPa (Units 5–6). All units are equipped with electrostatic precipitators and gas monitoring equipment. Low sulfur (0.43 % average) and low NOx generating coal is used. Flue gas desulfurization and NOx reduction (primary and SCR) plants will be added in the coming years.

The bottom ash removal system operates with sea water (Units 1–4) and tap water (Units 5–6), while fly ash is pneumatically transferred. All ash is sold for applications in road and housing projects.

The chemical control is based on equilibrium phosphate treatment (EPT) in the smaller units and on oxygenated treatment in the larger ones (which switched to that treatment from EPT about two years ago).

The pH in the feedwater is different from unit to unit in accordance with the metallurgy (copper free, almost copper free and with copper tube heaters). The units are sea water cooled, with all condensers made of titanium tubing. Units 1–4 still use a small amount of hydrazine. The makeup water is produced by ion exchange. The GE generator stators are water cooled and the turbine control fluid is a phosphate ester.



What are the main tasks of the Chemistry and Environment Group?

- We are in charge of choosing, defining, applying and checking the type of chemical control. Our group reports to the production superintendent and works closely with the shift people (which include a shift chemical operator). In defining strategically important decisions we work together with the Central Headquarters Chief Chemist's Department.
- We coordinate the maintenance of the chemical plants: demineralized water production, chemical dosing, wastewater treatment plant, and the chemical analyzer room.
- We are in charge of the safe handling of hazardous chemicals and report to various official control groups on environmental protection (chemicals, sea and air discharge, spillage on ground or water).
- We perform a wide range of analytical activities for the Operations, Electrical and Mechanical Departments (water, oil, coal and ash). We maintain the automatic analyzers (together with the Control Department).

- We are in charge of operating the wastewater treatment plant (one of the first to operate in the country).
- We take part in solving problems and suggest improvements for existing processes.
- We are in charge of ordering chemicals and resins for routine operation, outages and development projects. We check suppliers' offers for our field and represent the plant at the bidding committee.
- We are part of the various projects in the "green energy" field.
- We are part of the plant's workgroups for ISO 9001 and ILO (a safety standard program).
- We supply some of our services to outside clients (for instance, to gas turbine operators).
- We are in charge of cooperation with the Planning Division for the commissioning of all chemistry-related equipment.
- We take part in various emergency drills and chemical instruction for other departments in the company. We accompany visitors to our "Visitors' Center" according to our plant manager's requests. We take part in community activities when needed.
- One of our group's members is the so-called "Mr. Combustion," a liaison person between the coal suppliers, operations and maintenance people in regard to any coal mill, burner, and precipitator problems.
- During outages we inspect the pipes and vessels together with the maintenance people.
- We take part in the activities of knowledge exchange groups like FOMIS, VGB, EPRI, NACE, and EUR-ELEC.



Victor Marcu (M.Sc., Physical Chemistry, Polytechnical Institute of Bucharest, Romania, Ph.D., Chemistry, Weizmann Institute, Rehovot, Israel) has 18 years of power plant experience in commissioning water treatment installations, in management of chemical labs and as environment group leader during the last 5 years. He has coauthored over 30 papers in the fields of semiconductor photoelectrochemistry, kinetics of solids and power plant water treatment.

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How many people work in your group?

Thirteen. That is 0.5 people per 100 MW.

We thank you for your time and willing responses to our questions. We are sure that we will receive comments on this interview from our readers. They will all be passed on to you. Thanks again, Victor.