



# The SAISC and guests from the Department of Trade and Industry TAKE A ROAD TRIP TO

# KUSILE POWER STATION



by Kobus De Beer, Director, Polasa



The Southern African Institute of Steel Construction (SAISC) believes in informed decision making. For the past three years we've arranged a visit for DTI, IDC, Treasury, SARS Customs and others to the Kusile Power Station Construction Site near Bronkhorstspuit. The objective is for visitors to experience the size and scope of the largest construction project in the Southern hemisphere, where world class fabricated structural steel is used extensively. Our host was Mitsubishi Hitachi Power Systems Africa (Pty) Ltd.

The six boiler houses at Kusile are in varying degrees of construction with the first unit heading for completion within this year. To see a 17 000 ton fabricated structural steel building rise 110m into the sky supported by four 3m x 3m square fabricated steel columns on each corner is impressive! There is no substitute for being there in person and experiencing the dynamics of this world class project. The massive roof structure is lifted into position using strand jacking and the boiler and all ancillary equipment hangs from this roof. A number of the largest construction cranes used in the world are working here.

The short bus ride provided an excellent opportunity for networking as well as

showcasing the activities of the SAISC and current projects our members are involved in.

The excursion was used to highlight some of the many unseen aspects of structural steel fabrication and construction:

- The overall design of the power station is the responsibility of the main contractors (Mitsubishi Hitachi Power Systems Africa (Pty) Ltd and Alstom) who have to specify how this complex system, comprising six coal fired boilers, six steam driven generators with air cooling must operate to each reliably achieve the required 800 MW electricity output for many years.
- Based on this the main structural steel contractor then has to do detailed designs and drawings to ensure that the structural steel components will comply with the specified dimensions and strength requirements. It is also very important to design for ease of construction as many pieces have to be fitted at height and rely on matching lengths and holes!
- The steel used has to comply with strict requirements of chemical content, properties and dimensions and every piece of steel must be traceable to its original casting or batch.

- The fabrication process requires optimal designs and detailed drawings balancing functionality, efficient manufacture and construction within strictly specified tolerances. Shop drawings are of extreme importance as the main means of communication



with the buyers, planners, stockyards, fabrication workshops, assemblers and welders, painters, quality assurance and others.

- All the pieces must be made in the right sequence and supplied in balanced quantities so that construction can proceed smoothly.
- Transport to and storage of fabricated structural steel products on or near the site is a major requirement - every piece must therefore be marked and good records kept of these continually changing stocks!
- Provision must be made for bad weather and working in muddy conditions!
- Someone had to calculate the costs in advance and someone else must now make sure that it works out as estimated!

- Every working person in the factory and on site has to be formally qualified to do his or her job, must be safety trained, must be equipped with personal and working safety equipment, and tools they are qualified to use. They must also be managed to work efficiently and be paid fairly and on time.

The site visit was followed by a visit to the GENREC Engineering works in Wadeville, Germiston where some of the Fabricated Structural Steelwork that included the massive columns weighing up to 70 tons were manufactured. It was sobering and disappointing to see this workshop that last year still had 2 500 people employed is now down to 250.

There is no doubt that our industry is facing some very challenging conditions. The SAISC is committed engaging stakeholders, raising the concerns of our members and together, finding a way forward. We received excellent feedback from the various participants on this excursion, and some of them will want to go again to see the progress made next year.

The Department of Trade and Industry has responded very positively by formally designating a range of fabricated structural steel and related products. "Designation" is an instruction to all State Owned Enterprises such as Eskom, Transnet, TPT, the Ports Authorities, Provinces and Municipalities to purchase 100% of their requirements for these products made in South Africa! This will immediately have a positive impact on local job creation and preservation, and will serve South Africa well with all its future major capital projects.



Thank you so much for the visit to Kusile. It feels so good to witness such good work using mostly our very own raw materials! The project is enormous! history in the making.

- N Dlambulo, Director: Ferrous Metals, Industrial Development Division

I'd like to express my sincere gratitude to all of you for a well planned and executed tour/visit on Friday.

I've personally been on many tours across the world and the tour on Friday is right up there... amongst the best. The talk/presentation on the bus whilst travelling was an excellent idea. You'll very cleverly maximised the day and made best use of a captive audience.

- S Moodley, Chairman: Metpress

