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ESKOM ENVIRONMENTAL IMPACT ASSESSMENT (EIA:12/12/20/944) FOR A PROPOSED NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE: COMMENTS ON THE REVISED PLAN OF STUDY FOR EIA

Your correspondence to Ms. Bongji Shinga of ACER (Africa) entitled "*Comment on the amended PoS for EIA ref EIA: 12/12/20/944*" refers.

Arcus GIBB acknowledges receipt of the above-mentioned letter. We thank you for your valuable comments and your participation in the Eskom Nuclear Power Station (NPS) Environmental Impact Assessment (EIA) process to date. Your questions and comments concerning the Nuclear-1 have been noted.

Responses to your comments / questions are as follows:

Your comment (1)

The requirements for another 20 000 MW of nuclear (or any other power) needs to be demonstrated and should take into account that energy saving in all forms will be the focus globally which inevitably will lead to a change our power needs and methods of generating substantially.

Response (1)

Your comment is noted. The Final Scoping Report states that "*based on Eskom's predictions, there is a requirement for more than 40 000 Megawatts (MW) of electricity generating capacity over the next 20 years in South Africa*" and that "*...the Eskom board has approved the investigation of up to 20 000 MW of nuclear capacity over the next 20 years.*" Furthermore, as mentioned in the scoping report all demand calculations include Eskom's target to save 8 000MW, through various demand side management programmes and Energy efficiency drives by the year 2025.

Your comment (2)

A side by side life cycle cost comparison with all feasible alternatives, based on common assumptions & parameters including inter alia the following elements:

Response (2)

Your comment is noted. This EIA process is specifically focused on the actual development (construction, operation and decommission) of the NPS. It is not within the scope of this EIA to undertake an in-depth and/or strategic analysis of alternative forms of power generation; however the Scoping Report does discuss the strategic process followed by the South African Government to determine an appropriate energy mix for South Africa. This is the National Integrated Resource planning (NIRP) process which includes an opportunity for public participation.



The environmental impacts associated with other components of the life cycle such as the mining of uranium do not form part of the scope of this EIA process and will have to be addressed as part of the EIA undertaken within the ambit of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) and the NEMA, as part of the application for a mining right to develop (construct, operate and decommission) uranium mine/s.

Further the Scoping Report did discuss alternative power generating technologies and where appropriate such discussions will be expanded in the EIR.

Your comment (2.1)

- 2.1 Capital acquisition costs including
 - 2.1.1 Cost overrun provisions based on historic international experience.
 - 2.1.2 Time of construction best & worst case cost.

Response (2.1)

Your comment will be relayed to the Economic Specialist who will discuss these aspects in general. Specific costs will not be discussed in the EIA. This project will be subject to various other approval processes including the Public Finance Management approval and the NERSA licensing process which is open for public comment.

- 2.2 Operational costs.

Response (2.2)

Your comment will be relayed to the Economic Specialist.

Your comment (2.3)

- 2.3 Fuel costs based on worst case scenarios.

Response (2.3)

Your comment will be relayed to the Economic Specialist.

Your comment (2.4)

- 2.4 Costs of de-commissioning.

Response (2.4)

Arcus GIBB will provide guidelines, principles and criteria based on international literature and best practice and specialist recommendations. In addition the means with which Eskom makes the required financial provision for decommissioning through the operational life of the power station will be discussed. The EMP will also contain specific commitments which will ensure responsible decommissioning.

Further, the EIR will also elaborate on the NNR's role and requirements on decommissioning, and address the long term impacts and the long-term sterilisation of land, as requested by DEAT in their letter dated 19 November 2008.

Your comment (2.5)

- 2.5 Cradle to grave costs of securing, storing, monitoring the radioactive waste produced by the proposed nuclear facilities over several millennium.



Response (2.5)

The disposal of non radioactive waste will be discussed in the Environmental Impact Report as well as the Environmental Management Plan (EMP). With respect to the various streams of radioactive waste, the EIR will include a discussion of radioactive waste, as well as the amount of waste (both radioactive and non-radioactive) that will be expected from the proposed NPS. Waste disposal and transportation will be further addressed in the EIR (as requested in DEAT letter date 19 November 2008).

In addition to the above handling of radioactive waste falls under the jurisdiction of the Minister of Minerals and Energy in terms of the Nuclear Energy Act, and is also subject to a licensing process from the NNR.

Your comment (2.6)

- 2.6 Cost of 3rd party liability insurance for worst case scenario following catastrophic nuclear accident e.g. wind blowing in direction of largest town/ city at time of nuclear accident at various wind speeds from minimum to maximum.

Response (2.6)

Your comment will be relayed to the Economic Specialist.

Your comment (2.7)

- 2.7 Estimated numbers of sustainable employment opportunities for skilled & semi skilled workers

Response (2.7)

Your comment is noted and will be relayed to the Socio-Economic Specialist.

Your comment (2.8)

- 2.8 Estimated numbers of micro & small business opportunities.

Response (2.8)

Your comment is noted and will be relayed to the Economic Specialist.

Your comment (2.9)

- 2.9 Estimated time from date of order to first commercial power delivery

Response (2.9)

It is estimated that the Nuclear power station will take approximately 6 years to construct from the time that the initial ground clearing to the commissioning of the first unit

Your comment (2.10)

- 2.10 Estimated time to finalise EIA.

Response (2.10)



Based on the current circumstances, it is anticipated that the final EIR will be submitted to the Department of Water Affairs and Environment (formerly known as DEAT and DWAF) within the first half of 2010

Your comment (2.11)

- 2.11 Costs of government subsidies and investment per industry.

Response (2.11)

Eskom has traditionally been a self-funding utility, accessing finance from revenues and the capital markets throughout the previous build programme. However, in the current environment Eskom's major challenge is to adequately cover escalating capital expenditure and operating costs (including primary energy), since current tariff levels do not generate sufficient revenue from regular operations to cover, in particular, future capital expenditure. The estimated total projected capital expenditure over the next five year period amounts to greater than R385 billion. The development of an appropriate funding model is underway with various stakeholders, including government.

Your comment (2.12)

- 2.12 Scheduled down times plus average unscheduled downtimes for replacement of bolts etc.

Response (2.12)

The applicable nuclear technology vendors have been suggesting figures of over 90% availability and an estimate of under 10% of planned and un-planned outages

Your comment (3)

A side by side life cycle environmental impact comparison including the following:

- 3.1 Infrastructure
- 3.2 Development
- 3.3 Possibility of multiple users on site – e.g. concentrating solar or wind & agriculture making the project more competitive.
- 3.4 GHG emissions based on full cycle including waste and radioactive waste storage, security and storage over several millennium.

Response (3)

In addition to the answers provided above, there are a number of issues that need to be taken care of when looking at the options for electricity generation; these include cost, lead time for construction, environmental impact, and operating characteristics relative to peaking and base load power generation. The planning for the construction of new power stations must also consider the different types of power stations that are required and their cost (which impacts on the price of electricity), the time taken to construct them, the environmental considerations and their operating characteristics. The total demand for electricity in South Africa is not constant; rather it varies on a 24-hour basis, with peak demand in the early morning and in the late afternoon / early evening. To optimally meet the total demand, it is thus necessary to have both "base load" electricity generating power stations designed specifically to generate electricity continuously at all hours, as well as "peaking" electricity generating power stations designed specifically to generate electricity only during the periods of peak demand. This is achieved by harnessing different energy sources and applying different technologies.



Chapter 8 of the Final Scoping Report for the Nuclear-1 EIA discusses alternative forms of power generation. Eskom is in the process of exploring a number of different ways in which to generate electricity and is investing in further development of renewable technologies.

The potential for multiple users on site is a possibility but would be subjected to various approval processes prior to approval. These would include an EIA and approval from the NNR.

Emissions based on full cycle including waste and radioactive waste storage, security and storage will be discussed in the Environmental Impact Report.

Your comment (4)

A side by side life cycle health impact comparison including the following under both normal and catastrophic accident scenarios:

- 4.1 Hazards of operation to workers and defects in their unborn children.
- 4.2 Impacts of emissions during normal operations particularly on risks to children of developing cancers in particular leukaemia.
- 4.3 Hazards of operation to general public and property based on minimum and maximum wind speeds.
- 4.4 Hazards of operation to environment, inter alia land including risks to agricultural land, organic farms, impacts on water bodies above & below ground, impacts on marine & other aquatic life.

Response (4)

Your comments are noted and will be relayed to the Human Health Risk Specialist as well as the Agricultural, Freshwater Ecology and Marine Specialists.

The Human Health Risk Assessment (HHRA) will assess the impacts of the nuclear power station (NPS) on human health as well as identifying potential receptors. For the full Terms of Reference for the HHRA, please see the Revised Plan of Study for EIA available on the following website: <http://projects.gibb.co.za/>.

However in terms of the agreement between the NNR and the Department of Environmental Affairs (DEA), the DEA will not make any pronouncements regarding radiological issues. All issues relating to radiological safety will be addressed through the NNR licensing process.

Your comment (5)

Probability of occurrence weighed against severity is only acceptable if the “unlikely” catastrophic events are comprehensively covered by realistic levels of liability insurance. While it may well be unlikely that Cape Town will experience a Chernobyl type event. It is not impossible – particularly with the strength of the Cape winds.

Response (5)

Your comment is noted. The reactor containment buildings of the reactor technology are designed to ensure that no radiation escapes under any conceivable circumstances, from a severe accident core meltdown accident like Chernobyl, an earthquake to a jumbo jet collision. The safety aspects of the nuclear power station will be discussed in the EIR. However safety will be evaluated as part of the NNR licensing process.

Your comment (6)



The DSR should include an assessment of the **desirability** of taking such an unparalleled risk however small that risk may be versus other energy options that do not pose any threat to the population or to one of our most prominent cities and tourist attractions.

Response (6)

Your comment is noted. Please refer to response (2) above.

Your comment (7)

The No Go Option in the DSR is based upon misleading information in that it is suggested that only power from coal or nuclear can provide sufficient energy to the Cape region.

The DSR must assess the impacts of a feed in grid so that the growth in small RE projects can combine to reduce the energy needs. Emerging technologies, such as thin film PV which is predicted to become the cheapest form of energy generation within the next few years, should be assessed, as within the timeframe to construct a nuclear plant, these technologies will be ripe.

Most important the “No Go Option” must fully evaluate the **combined** use of RE technologies such as wind, concentrating solar, wave, in amalgamation with pumped storage, with a centrally controlled integrated computerised grid. The reliability and strength of such a system lies in the combination of these technologies, simplicity of maintenance while still producing energy, pumped storage as a back up. Nuclear power can not rival the potential of mixed generation of RE as has been amply demonstrated by the many planned and unplanned failures a Koeberg.

Response (7)

The National Integrated Resource Planning process includes the consideration of all commercially available technologies. Your issues are noted, they are discussed in chapter 8 of the scoping report and where appropriate will be discussed further in the EIR.

In conclusion, the project team would like to assure you that Interested and Affected Parties comments are important to us and that your continued involvement in this process as an I&AP is valued. Your comments/questions will be captured in the draft EIR that will be submitted to the decision-making authority in due course.

Please do not hesitate to contact us at any stage should you require any additional information regarding this proposed project.

We thank you for providing us the opportunity to respond to these questions and look forward to your ongoing involvement in the project.

Yours sincerely
For and on behalf of Arcus GIBB (Pty) Ltd

Jaana-Maria Ball
EIA Project Manager