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05 August 2015

Our Ref: J27035

Your Ref: Email received 05 August 2011

Email: alexander.vergus@mizuho-sc.com

Dear Alexander Vergus

RE: ESKOM EIA CONCERNS FOR THE PROPOSED NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE (DEA Ref. No: 12/12/20/944)

ESKOM – ENVIRONMENTAL IMPACT ASSESSMENT FOR A PROPOSED NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE: REVISED DRAFT EIR (DEA REF NO. 12/12/20/944) : REVISED DRAFT EIR

Comment 1:

We wish to express our concern that the EIR has not undertaken an adequate consideration of alternatives, particularly technology alternatives such as boiling water reactor (BWR) and advanced boiling water reactor (ABWR).

The EIR states that it would consider "a full range of different technologies". However, this does not seem to be the case, as there are several references where it is stated that Eskom has made up its mind that the technology for the new nuclear power station would be a Pressurized Water Reactor (PWR). See for instance the statement under the subheading "Assessment of alternatives – nuclear plant type alternatives" in the Executive Summary, which says that "two nuclear plant type alternatives belonging to the Pressurized Water Reactor (PWR) technology family are proposed" and also see section 4.6 – Proposed Technology of the revised EIR, which states that "the PWR technology…..is proposed as the technology for use in the new NPS".

It therefore appears that Eskom has made up its mind on the technology of choice, without considering the full range of technology alternatives available for a nuclear power station. It could therefore be argued that this EIA process is fundamentally flawed. Naturally, we reserve the right to comment further at a later stage in this process, and reserve the right to appeal any decision that may be made without full consideration of the technology options

Response 1:

Your comment is noted however it is not the purpose of the Environmental Impact Assessment (EIA) process to act as a selection mechanism or to drive procurement in terms of the nature of the technology to be used in the construction and operation of the Nuclear-1 Power Station. It is the purpose of the EIA to assess the impacts of the construction and operation of a Generation III type (as described by an envelope of criteria) reactor on three proposed sites in the Western and Eastern Cape Provinces of South Africa.

Table 5-3 of the Revised Draft EIR Version 1 does however indicate the five reactor technologies that Eskom short-listed following the screening phase for the proposed project, which occurred in 2006/7. The table provides a list of the various technologies and the salient features associated with each reactor type. Please note that the ABWR is included in this table.

Table Error! No text of specified style in document.**-1: Summary of Eskom's short-listed nuclear plant type technologies**

REACTOR TYPE	TECHNOLOGY	PLANT TYPE	SALIENT TECHNICAL FEATURES
Light Water Reactors	**Pressurised Water Reactor**	**AP1000**	**Reactor Thermal Power : 3 400 MWt** **Electrical Power Output: approximately 1140 MWe** **Safety systems such as:** • **Passive core cooling system (PXS)** • **Passive containment cooling system (PCS)** • **Control room emergency habitability systems (VES)** • **Containment isolation** **Efficiency (overall): 33.53%**
		EPR	**Reactor Thermal Power: 4 616 MWt** **Electrical Power Output: approximately 1 650 MWe** **Safety systems such as:** • **Three protective barriers** • **Core Catcher** • **Safety injection system** • **In-containment refuelling water storage system (IRWST)** **Efficiency of 35.75%**

REACTOR TYPE	TECHNOLOGY	PLANT TYPE	SALIENT TECHNICAL FEATURES
		RSA 1000	**Reactor Thermal Power : 2 895 MWt** **Electrical Power Output: 1 020 MWe** **Safety Aspects:** • **Several interconnecting systems resulting in various complex failure mechanisms** • **Proven technology with more likely design base incident optimized as a result of OE.** • **Operator intervention only necessary after 20 minutes.** **Overall efficiency: ~33%**
	Advanced Boiling Water Reactor	**ABWR**	**Reactor Thermal Power: 3 992 MWt** **Electrical Power Output: approximately 1 371 MWe** **Safety systems such as:** • **Vessel-mounted recirculation pumps** • **Fine motion control rod drives** • **Advanced digital and multiplexed instrumentation and control system** **Efficiency: Unknown with present data** **Overall efficiency: 34.34%**
Heavy Water Reactors	**CANDU**	**CANDU -6**	**Reactor Thermal Power: 2100 MWt** **Electrical Power Output: approximately 700 MWe** **Safety features such as:** • **Defence in depth design approach incorporate tri-level passiveness** • **Preventative boundaries (safety systems are separated physically and functionally) and two independent shutdown systems are built in at different levels** **Efficiency: 33.33%**

Comment 2:

Although the revised EIR refers to a “consistent data set” that was provided to all specialists to serve as a basis for that assessment, we are concerned that this approach is in reality merely intended to cover a decision already made by Eskom.

It is therefore our demand and we require Eskom to confirm that the envelope of nuclear power station characteristics and hence the “consistent data set” includes the characteristics of BWR/ABWR technology. We also require Eskom to confirm that all the specialist studies have taken the characteristics of BWR/ABWR technology into account in their impact assessments and that these are highlighted as alternatives. In the event that the “consistent data set” does not include the characteristics of the BWR/ABWR technology or that the specialist studies have not taken into account

in their impact assessments the characteristics of BWR/ABWR technology, we will require Eskom to revise the process in this EIR to ensure that these requirements are met. In addition, we require that the application for environmental authorisation of this project is not just for PWR technology, but also for BWR/ABWR technology.

Response 2:

Your comments are noted however it is the applicant's prerogative to procure the technology that best fulfils the needs and specifications of the Nuclear-1 Power Station in terms of the applicant's procurement procedures. However, the procurement process is now being led by Government and has not been decided on as yet. The PWR plant technology is premise on the Nuclear energy policy of South Africa.

It is furthermore common practice in EIA processes, especially for installation of industrial plants, to consider the performance of the systems and type of technology proposed to be installed, without referring to specific suppliers or manufacturers of this technology, of which there may be a range available in the market. As long as the inputs and outputs of the proposed technology are known and the environmental impacts can be predicted or deduced from these inputs and outputs with reasonable certainty, it is not necessary to know the brand name of the technology

Comment 3:

The legal basis for our demand is that the regulations (No. 385 of 2006 published on 21 April 2006) in terms of NEMA (National Environmental Management Act) state at Section 28(e) (iii): "….the EAP managing the application must…..subject the application to scoping by identifying…..alternatives to the proposed activity that are feasible and reasonable". It is to be noted that the regulations refer to alternatives to the activity, not alternatives to the location, and that the alternatives need to be "feasible and reasonable". The reasons for choosing the PWR technology as provided in Section 8.6 of the final scoping report do not provide any reasons for excluding other technologies from the EIR. The purpose of the EIR is to assess the potential environmental and social impacts of various alternatives. Alternatives can therefore not summarily be disregarded on the basis of the reasons provided in Section 8.6. The impacts by the alternative technologies may indeed be such as to make the alternatives the preferred technology from an environmental and social perspective. Further strength to the argument is provided in the Guidelines published by the Western Cape Department of Environmental Affairs & Development Planning in August 2010, in which it specifically states "Alternatives: the key consideration of EIA" (Section 3.1 of the Guideline on Alternatives, DEA&DP, August 2010) and that the alternatives may include "the technology to be used in the activity". It is significant that in the comments received on the revised PoS of EIA, DEAT and DEA&DP indicate the lack of clarity on what types of alternatives will be assessed, other than site layout alternatives, with DEA&DP specifically stating that technology alternatives should form part of the EIA investigation.

Response 3:

The author is reminded not to quote sections of the legislation out of context in order to highlight its own agenda. The consideration of alternatives in a project is indeed a key requirement of an EIA as it provides a basis for choice for the competent authority and I&APs. The NEMA EIA Regulations of 2006 define alternatives in relation to a proposed activity as "different means of meeting the general purpose and requirements of the activity, which **may** include alternatives to the –

(a) property on which or location where it is proposed to undertake the activity;
(b) type of activity to be undertaken;

(c) design or layout of the activity;
(d) technology to be used in the activity; and
(e) operational aspects of the activity;"

Alternatives are considered as a means of reaching the same need and purpose as the originally proposed project design in a way that minimises its negative and maximises its positive impacts. Alternatives that are considered must be reasonable and feasible.

In the case of Nuclear-1 the following alternatives (including Nuclear plant types) were assessed:

- Location of the power station;
- Forms of power generation;
- Nuclear plant types;
- Layout of the nuclear plant;
- Fresh water supply and utilisation of abstracted groundwater;
- Management of brine;
- Intake of sea water;
- Outlet of water and chemical effluent;
- Management of spoil material;
- Access to the proposed sites; and
- The no-development alternative (i.e. 'No-Go').

PREVIOUS PROCUREMENT PROCESS

Comment 4:

We wish to question the relevance of this EIR, as it does not seem to take into consideration a previous procurement process through which the AP1000 and EPR technologies were prequalified; a procurement process which has since been terminated, as it was found that the technologies offered (AP1000 and EPR) were not affordable. We therefore do not see the sense in undertaking an EIA on a project description for a technology that was previously found to be unaffordable. The EIR can therefore only be relevant if the project description is expanded to cover all possible technologies, including BWR and ABWR.

Response 4:

The PWR plant technology is premised on the Nuclear Energy policy of South Africa. In 2009, Eskom abandoned the procurement process due to funding constraints particularly in the context of the global financial crisis. At that stage Government supported this decision to ensure that Eskom does not over-extend its balance sheet and that its ability to provide the economy with competitively priced energy is not jeopardized. The procurement process will now be led by Government.

Comment 5:

CONCLUSION

At this stage our demands do not include the need for Eskom to revise the Plan of Study or for the specialists to revise their reports, as it is up to Eskom and the EAP to decide what changes to the EIA process they would need to make in order to meet our requirements.

Response 6:

Your comments are noted however the EIA process will not be altered in order to consider the BWR and ABWR type technologies.

Yours faithfully
for GIBB (Pty) Ltd

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The Nuclear-1 EIA Team