

5 August 2015

Our Ref: J27035 / J31314

Your Ref: Email received 03 August 2011

Email: kimchris@telkomsa.net

Dear Ms Kruyshaar



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

Comment 1:

I have a number of concerns with the DEIA as follows:

Economic impacts: I have major concerns about the economic impacts of the NPS and believe that the EIAR fails to consider the economic impacts that the construction of the NPS will have on South Africa. Typical of the development of Nuclear Power Stations worldwide are the massive cost overruns – I do not believe that this will not happen in RSA. As a tax payer, and a committed South African I believe that I have a right to veto the financial investments that my country makes and the debt incurs for to me and my children. The economic assessment does not encourage me that nuclear is a responsible investment in energy or energy security. In addition, nuclear power stations take many years, often exceeding 10 years to develop which has significant economic implications for potential energy users. Non Nuclear alternative energy would provide faster, safer and cheaper power long before the NPS is completed.

I do not support the NPS programme on the grounds that it is economically undesirable for a number of reasons and will place the people of South Africa in an unacceptable debt situation.

Alternative Energy generation options are not adequately assessed. Neither is a no-go option. I understand that it is a legal requirement to assess alternative options, not just sites as well as a no go option. The benefits of non-nuclear alternative energy need to be included in the DEIA if this is to be an honest and professional decision-making tool.

Response 1:

Your comments are noted. There are indeed many technologies (including alternative/renewable energy sources) which could be employed to generate energy to meet South Africa's current and future energy demand. The choice of technologies, described in Chapter 5 of the Revised Draft EIR Version 1 and the weighting to be given to each in terms of addressing South Africa's energy requirements is provided for information but does not fall within the ambit of this Environmental Impact Assessment (EIA). It falls within the ambit of strategic government initiatives such as the Integrated Resources Plan 2010. Further, the affordability to South Africa is assessed through the National Energy Regulator of South Africa tariff process. Both the IRP and NERSA tariff process are subject to



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an extensive public participation process. Carrying out such a debate during the EIA process would be duplication.

This EIA and Application for Environmental Authorisation is therefore not a strategic assessment of South Africa's energy requirements and the future energy mix proposed to address these requirements or an investigation into the pros and cons of the use of Nuclear Power versus Renewable/Alternative Energy. It is a tool used to assess the possible positive or negative impact which the proposed project may have on a specific receiving environment, which in this case are the Duynefontein, Bantamsklip and Thyspunt sites.

Despite the site specific nature of the EIA process the Economic Report (Appendix E17 of the Revised Draft EIR Version 1 – Section 3.3) prepared by Conningarth Economists and Imani Development (SA) (Pty) Ltd nevertheless conducts a macroeconomic equilibrium analysis in order to quantify the macroeconomic impact associated with the possible construction and operation of the Nuclear-1 Power Station.

The report acknowledges that, as the nuclear power station is such a large capital investment (equivalent to that of six times the capital investment in Gautrain), the economic ripple effects will go far beyond its direct boundaries. We refer the author to section 3.3 of the report for an expanded discussion.

Lastly we confirm that it is a legal requirement in terms of the National Environmental Management Act to assess feasible alternatives, which is defined to mean *different means of meeting the general purpose and requirements of the activity* – in the case of this EIA, the activity is the construction and operation of a Nuclear Power Station at either the Duynefontein, Bantamsklip or Thyspunt sites. As such Chapters 5, 9 and 10 of the Revised Draft EIR Version 1 discusses alternatives which include:

- Location of the power station;
- 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.

Comment 2:

Risk not adequately dealt with: Japan is ample proof of the crippling impact socially, environmentally and economically of a worst case scenario. The EIAR fails to assess worst-case scenario impacts and generally fails to convince me that even a serious incident will be openly, responsibly and adequately addressed. For the sake of the citizens today and in the future, South African decision makers must learn from the lessons of Fukushima and reject a nuclear option.

I do not support the NPS programme on the grounds that it places an unacceptable risk on the people and environment of South Africa in the possible event of a serious accident or natural disaster.

Response 2:

Your comment is noted. It is acknowledged that the incident at Fukushima as a result of this natural disaster has highlighted many important safety factors in terms of the future of nuclear energy and is indeed a stark reminder of the unpredictability of the natural environment. However it is also well known that South Africa is located on a vastly more stable tectonic environment than that of Japan which is situated close to a major subduction zone within the Pacific Ocean.

Please note that site safety issues are considered on a high level in the Emergency Response and Site Control Reports (Appendix E26 and E27 of the Revised Draft EIR) and will also be dealt with in the NNR process. This process will also be open for public scrutiny and comment.

ADDITIONAL COMMENTS FROM INDEPENDENT NUCLEAR SPECIALIST

The international nuclear power community, and international nuclear representative organisations, are looking at what recommendations they will be formulating to be implemented to ensure the guaranteed safety of nuclear plants at all nuclear power stations around the world. As at the time of my preparing this brief report, Dr Mike Weightman of the Health & Safety Executive's Office for Nuclear Regulation - ONR - in Britain would appear to have been the first to prepare an interim report. (See UK HSE's ONR website url: <http://www.hse.gov.uk/nuclear/fukushima/interim-report.htm>)

It should be noted that a fundamental principle of the nuclear and radiological safety is that over and above meeting specific limits the licence applicant demonstrate the incorporation of ALARA principles and this reinforces that existing approach

Comment 3:

Nuclear Waste not adequately dealt with. There is no long term solution for the waste. The issue of the costs of managing the waste and its disposal is not adequately addressed.

Response 3:

Thank you. Your comments are noted. It is acknowledged that the issues of radioactive waste management is important and integral to debate surrounding nuclear energy and as stated the current global practice is long-term storage of the spent fuel at the nuclear power station. However please note that the radioactive waste management practices envisaged for Nuclear-1 are consistent with the IAEA guidelines for a Radioactive Waste Management Programme for nuclear power stations, from generation to disposal. Nuclear Power Station strives to minimise production of all solid, liquid and gaseous radioactive waste, both in terms of volume and activity content, as required for new reactor designs. This is being done through appropriate processing, conditioning, handling and storage systems. In addition, production of radioactive waste is minimised by applying latest technology and best practices for radiological zoning, provision of active drainage and ventilation, appropriate finishes and handling of solid radioactive waste. Where possible, the Nuclear-1 power station will reuse or recycle materials.

All forms of radioactive wastes are strictly controlled and numerous specialised systems and management practices are in place to prevent uncontrolled contact with these substances. These controls and practices differ for the different forms of radioactive waste. South Africa still has to

formally release a strategy for the long-term management of HLW, including spent fuel. Until such time, all spent fuel is stored temporarily either in spent fuel pools (wet storage), or in dry cask storage facilities (dry storage). This allows the shorter-lived isotopes to decay before further handling, a management strategy that is acceptable from a safety perspective. It must be noted however that as per the Department of Energy's Media Statement on Nuclear Procurement Process Update as released on 14 July 2015 strategies are complete to develop an approach for South Africa to deal with Spent Fuel/High Level Waste disposal.

Disposal of radioactive waste at an authorised facility is being done according to an approved disposal concept, defined and developed with due consideration of the nature of the waste to be disposed of and the natural environmental system, collectively referred to as the disposal system. The disposal system developed for this purpose makes provision for the containment of radionuclides until such time that any releases from the waste no longer pose radiological risks to human health and the environment. The safety assessment process used as basis for this purpose considers both intentional (as part of the design criteria) and unintentional (natural or human induced conditions) releases of radionuclides. Unintentional releases include consideration of unintentional human or animal intrusion conditions, which might lead to direct access and external exposure to radiation.

Once released into the environment, radionuclides might migrate through the environmental system along three principle pathways: atmospheric, groundwater and surface water. Due to the physical nature of L&ILW and HLW disposal concepts, migration along the atmospheric pathway is highly unlikely. The principle environmental pathway of concern is thus the groundwater pathway, with the surface water pathway of secondary concern as an extension of the groundwater pathway. Disposal systems are designed so that releases to groundwater or surface water are highly unlikely as further explained in Chapter 10 of this EIR.

ADDITIONAL COMMENTS FROM INDEPENDENT NUCLEAR SPECIALIST

Whilst the proposed facility is not yet the subject of a specific licence application and the exact safety case requirements that may be set by the NNR are not yet determined the NNR does currently require assessment of external events as stated and as such any assessment methodology can only at this stage be based upon international best practice and as stated in general the NRC requirements are widely used in this regard elsewhere - as such our nuclear safety process is not prescriptive and requires the applicant to demonstrate the safety of the proposed facility - part of the safety case will inevitably entail and adequate demonstration of the robustness of the methodology in the context of international best practice

Comment 4:

Final project design is lacking which makes an assessment of the direct impacts impossible.

Response 4:

Your comments are noted. We assume that you are referring to design detail in terms of the reactor type/manufacture to be used as you have not defined the lack of design detail in your statement above.

It is 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.

As has been done in other issues and response reports, it may be appropriate to explain the envelope of criteria in colloquial terms, as has been done in public meetings during the Nuclear-1 EIA process. If the envelope of criteria is compared to the specifications for buying a vehicle, this envelope may contain requirements with respect to top speed, fuel type, fuel efficiency, catalytic convertor performance, type of tyres and wheels, fuel tank size, effective range, CO2 emission limits, cruise control, numbers and positions of airbags and a number of other safety systems such as ABS and EBD. The only thing that isn't specified is the brand of vehicle. Providing such a list of criteria would ensure that only a luxury vehicle with certain characteristics could qualify, but that a base model (entry-level vehicle) would not qualify. Similarly, if a vendor proposes a power station design that fails to comply with the criteria established in the Consistent Dataset, that design will not qualify for consideration.

Assuming that an authorisation is granted by the DEA, a power station design that deviates significantly from that specified in the Consistent Dataset in the Nuclear-1 EIR (Appendix C of the Revised Draft EIR) would render the design incapable of meeting the requirements of the EIR and the authorisation. Hence such a non-confirming design could not be considered for construction.

Comment 5:

I believe that in its current form, the DEIA is not adequate as a decision-making tool. In view of the seriousness of the development and the potential long term consequences and risks should it be approved, it is essential that all the concerns raised above are comprehensively addressed and added to the report.

Response 5:

The Environmental Impact Assessment is only one part of the decision making process, as referred to above there are high level planning processes that inform the technology mix for South Africa, the NERSA process to evaluate and approve tariff increases, Eskom has internal processes which evaluate the business case and various detailed studies for the nuclear safety issues. This EIA assesses the environmental aspects of the project and the project could not proceed based only on the EIA approval.

All your comments are noted and will be added to the Revised Draft EIR Version 2 and Final EIR which will be placed before the Competent Authority for decision making.

Yours faithfully
for GIBB (Pty) Ltd



The Nuclear-1 EIA Team