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Attention: Ms Nadia Pheiffer

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED ESKOM NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE: COMMENTS REGARDING THE ESKOM NUCLEAR-1 ENVIRONMENTAL IMPACT ASSESSMENT

Dear Ms Pheiffer

Your correspondence to Ms. Bongzi Shinga of ACER Africa entitled “*Ms Nadia Pheiffer, Stanford – Overberg*” 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 concerning the Nuclear-1 EIA process have been noted.

Responses to your comments / questions are as follows:

Comment (1):

Kindly guide me in this public participation process regarding the Bantamsklip Nuclear Power stations.

There are many concerned residents in our area who would like to be involved both in the EIA of the transmission lines as well as the Nuclear power stations. Theo Hansford gave your details and suggested contacting you in order that we might do so.

Response (1):

The identification and registration of Interested and Affected Parties (I&APs) occurs throughout the duration of the EIA process. I&APs are identified by using existing databases, Internet searches, stakeholder referrals (as in your case), advertisements, completed comment sheets and attendance registers at meetings. Much of the initial identification of I&APs occurs during the initial scoping phases of the EIA process.

The environmental assessment processes for both the Transmission and Nuclear 1 project EIA was widely announced with an invitation to the general public to register as I&APs and to actively participate in the Public Participation Process (PPP).



- *Print media **advertisements** in English and Afrikaans were placed in national, regional and local newspapers for the project announcement;*
- ***Key Stakeholders** were contacted telephonically and informed of the project and the EIA process;*
- *A **letter of invitation** (dated 5 July 2007) was faxed to Key Stakeholders inviting them to Key Stakeholder Workshops in the Eastern, Northern and Western Cape Provinces as well as informing them of the project and inviting their participation in the EIA process. Follow up contact was also made telephonically;*
- *A personally addressed **letter of invitation** written in English and Afrikaans was sent on 25 May 2007 to identified I&APs announcing the project and opportunities for participation;*
- *A **Background Information Document** (BID) and comment sheet were produced in English, Afrikaans and Xhosa detailing the proposed project and explaining the EIA process. The BID was mailed to I&APs on the database, uploaded on the website and delivered to identified strategic public venues;*
- *Copies of the BID were also made available to I&APs as and when requested. Public documents were also made available;*
- *The Eskom and Arcus GIBB websites were used to house the various public documents, which have been available on line from 28 May 2007 and will continue to be available throughout the project. The website address is **www.eskom.co.za/eia** under “Nuclear1” link or alternatively **www.gibb.co.za**.*

In order to register as an Interested and Affected Party, you can fax, post or email your details (name, contact details etc) to Acer (Africa) Environmental Management Consultants, and request that your name be added to our Stakeholder Database. ACER Africa are the Public Participation Consultant on the Nuclear-1 Project. Their details are as follows:

*ACER (Africa) Environmental Management Consultants
Ms Bongji Shinga
PO Box 503, Mtunzini, 3867
Tel: 086 010 4958 (cost of a local call)
Fax: 035 340 2232
Email: nuclear1@acerafrica.co.za*



Figure 1 below illustrates the EIA Process, and indicates how Public Participation plays an integral role in the process.

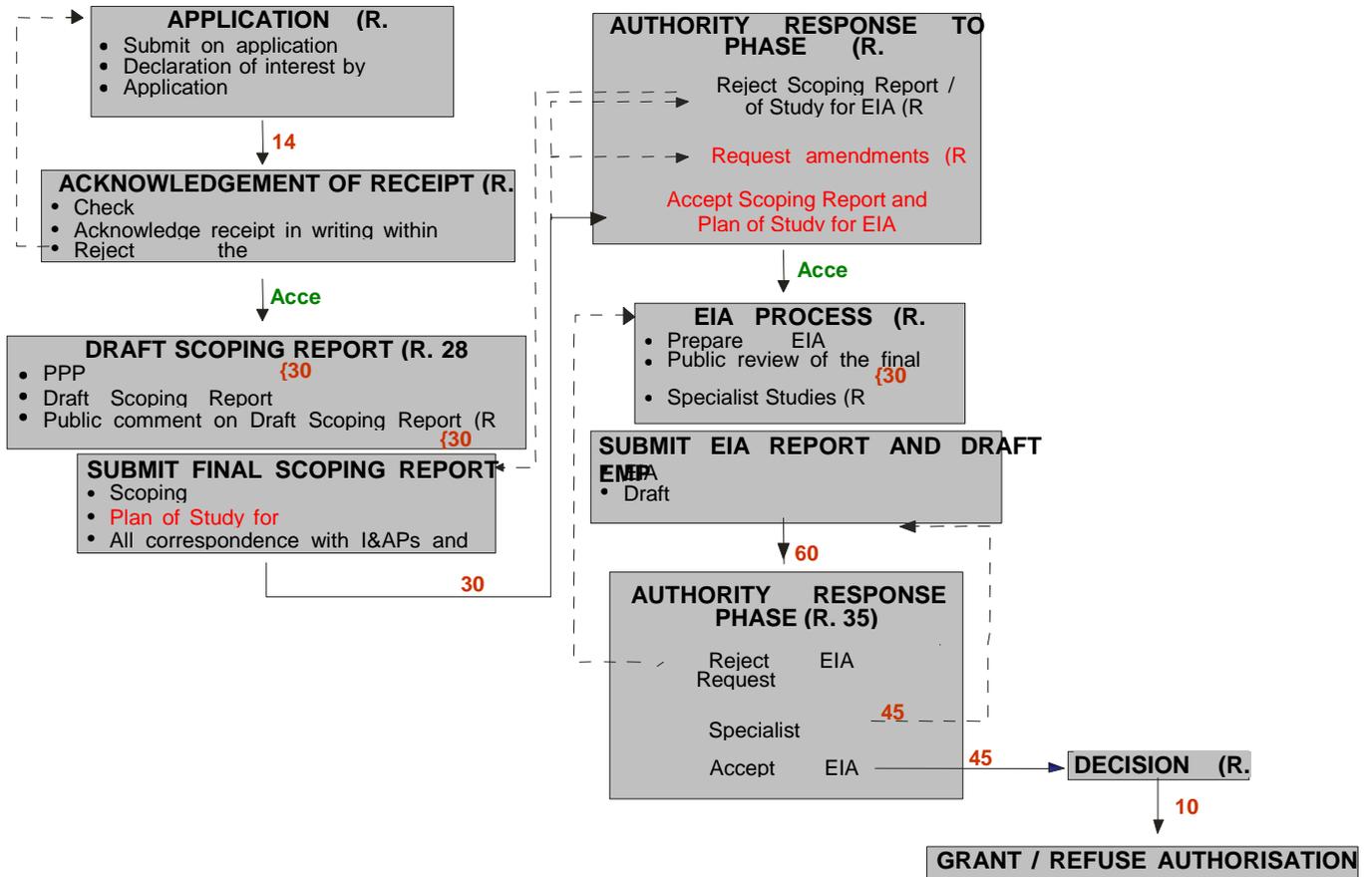


Figure 1: EIA Process as prescribed by the NEMA Regulations

Finally, with respect to the Transmission EIA and the Nuclear-1 Project (site) EIA, the two studies are carried out separately. Both projects have finalised the scoping phase, the draft Environmental Impact Reports will be released for comment. During the comment period public meetings will take place.

With specific reference to cumulative impacts, each of the EIAs will consider cumulative impacts on all issues specific to the respective EIA. Every attempt has been made to run the plant and transmission line EIA processes as close to parallel as possible, within the constraints identified above, in order to facilitate the flow of information across the processes. Although each EIA will focus on assessing the specific issues related to the respective EIA issues pertinent to the corresponding EIA will be discussed in the nuclear plant EIA as well as the transmission line EIA.

Comment (2):

I would further appreciate your help in understanding what a public participation involves. What are the aims and objectives of a public participation process? How is it measured and what influence in the planning and or decision-making does it hold?



Response (2):

Public participation is an essential and legislative requirement for environmental authorisation. The principles that demand communication with society at large are best embodied in the principles of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (Chapter 1), which is South Africa's overarching law that governs the environment. In addition, the Guideline Document – EIA Regulations on the implementation of Sections 21, 22 and 26 of the Environment Conservation Act, guide the Public Participation Process that is required for an EIA.

The PPP for the proposed NPS and Associated Infrastructure was undertaken by ACER Africa Environmental Management Consultants (ACER). The PPP was designed to satisfy the requirements as stipulated in the above-mentioned legislation and guidelines.

The objectives of public participation in an EIA are to provide sufficient and accessible information to I&APs in an unbiased manner to assist I&APs to achieve the following during the EIA process:

The Scoping Phase entails the following:

- Identify issues of concern, and provide suggestions for enhanced benefits and alternatives;*
- Contribute to local knowledge and experience; and*
- Verify that their issues have been correctly captured and considered.*

The detailed Impact Assessment Phase of the EIA entails the following:

- Verify that I&AP issues have been considered either by the EIA Specialist Studies or elsewhere; and*
- Comment on the findings of the EIA, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.*

The EIA for the Nuclear-1 project is currently entering the Impact Assessment Phase. The key objective of public participation during the Scoping Phase is to help define the scope of the technical studies to be undertaken during the Impact Assessment Phase of the EIA.

The findings of the Scoping Process are presented in the Draft and Final Scoping Reports. For the process to be completed, I&APs needed to be given an opportunity to verify these findings prior to the submission of the Final Scoping Report to the environmental Authorities. For this purpose, the opportunities provided for the public review of the DSR comprised the following:

- Distribution of the DSR to key stakeholders and the general public;*
- Participative discussions on the DSR with various key stakeholder groups to facilitate its review; and*
- Public Open Days to present the findings of the DSR.*

The DSR was available from 30 January 2008 – 14 March 2008 at the public places listed in Table 1 below.

Comment (3)

I am also interested in what type of Nuclear Reactors are being planned and how they work, the amount of sea water that will be used for the cooling system, the radiation level that this water will re-enter the sea with as well as the temperature. How much radiation is to be expected in both the creation of energy, the cooling as well as in the transportation. Are there guidelines regarding accepted radiation levels both in sea and on land and what are they?



Response (3):

Eskom is currently considering plant alternatives belonging to the Pressurised Water Reactor (PWR) technology, this is the same technology as the Koeberg Nuclear Power Station.

Nuclear fuel is used to heat water in a reactor in a similar way that the heat from burning coal in a coal-fired power station is used to boil water and create steam. A very high pressure is maintained in the primary circuit of PWR to prevent the water from boiling.

The typical pressure in the reactor pressure vessel, which forms part of the primary circuit, is approximately 150 bars, and the temperature in the reactor is approximately 300°C. Water is also heated, under pressure, in a secondary circuit to create steam.

As depicted in the **Figure 2 below**, the pressurized water in the primary circuit indicated in yellow passes through separate steam generator loops, giving up some of its heat in the process, from where it is pumped back into the reactor (primary circuit) where it picks up more heat. The water in the secondary circuit indicated in red is also converted into steam, which similarly to the primary loop is used to turn the turbine and electrical generator. After the steam has passed through the turbine it is condensed back to water so that pumping it back to the steam generators' secondary circuit side where once again it is converted into steam, which can be reused. The steam is condensed to water by cooling water, which is in a third separate circuit indicated in green.

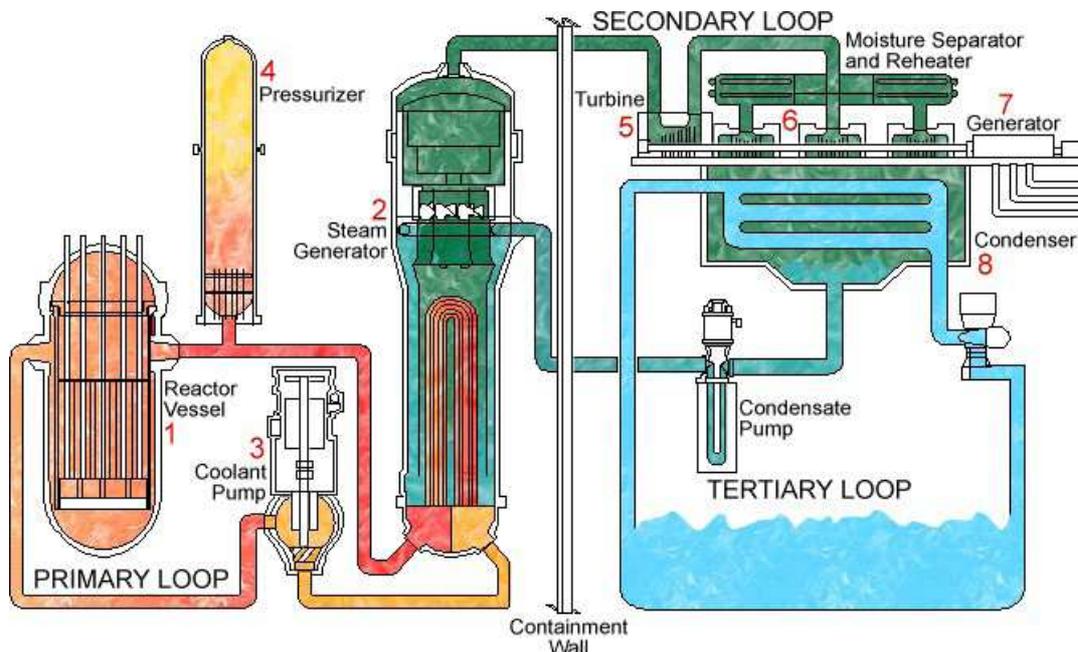


Figure 2: Basic Layout of the Koeberg Power Station (NPS)

It is important to note that at no point does any water come into contact with the generator, rather the heat from the generator is transferred by means of various conductive circuits.

PWR are the most commonly used nuclear reactors both locally and globally. The existing NPS, Koeberg, uses PWR technology and it is therefore a proven, reliable and tested form of power generation. Eskom is therefore familiar with the technology from health and safety as well as operational perspectives based on its experience with Koeberg.



For more details regarding the Nuclear Reactors, please refer to Chapter 8 of the Scoping Report which is available at: www.eskom.co.za/eia under “Nuclear1” link. Alternatively, see Table 1 below which details where hard copies of the Scoping Report have been made available in the Western Cape:

Table 1: List of public places in the project area where the Draft Scoping Report was lodged for public review.

Cape Town	ARCUS GIBB (Cape Town Offices)	14 Kloof Street, Cape Town	021 409 9100
Atlantis	Atlantis Public Library	Civic Centre, Grosvenor Avenue	021 572 3527
Baardskeedersbos	Baardskeedersbos Winkel	22km from Gansbaai on the Elim Road	028 381 9676
Beaufort West	Beaufort West Public Library	15 Church Street	023 414 8180
Bredasdorp	Bredasdorp Public Library	Church Street, Bredasdorp	028 425 1919
Cape Town	Cape Town Central Library	City Hall, 2nd Floor, Darling Street	021 4671567/8/9
Bredasdorp	Cape Agulhas Tourism Bureau, Bredasdorp	51 Long Street, Bredasdorp	028 424 2584
Clanwilliam	Clanwilliam Public Library	Main Street, Clanwilliam	027 482 8000
Elim	Elim Library Depot	3 Waterkant Street, Elim	028 482 1803
Gansbaai	Gansbaai Public Library	Main Road, Municipal Buildings	028 384 0111
Hermanus	Hermanus Public Library	Civic Centre, Magnolia Street	028 313 8012
Koeborg	Koeborg Public Library	Merchant Walk, Duynfontein	021 553 2514
Laingsburg	Laingsburg Public Library	Van Riebeck Street	023 651 1019
Malmesbury	Malmesbury Public Library	Voortrekker Road	022 487 9439
Milnerton	Milnerton Public Library	Piensaar Road	021 550 1131
Onrus River	Overstrand Conservation Foundation	23 Molleno Street, Onrus River	028 316 2181
Grabouw	Palmiet Pumped Storage Scheme, Visitors Centre	Rookview Dam Road, off N2 South, Grabouw	021 859 2690
Piketberg	Piketberg Public Library	13 Church Street	022 913 8063
Vredenburg	Vredenburg Public Library	12 Main Street	022 701 7004
Bredasdorp	Welverdiend Public Library	Ou Meule Street, Bredasdorp	028 425 1919
Atlantis	Wesfleur Library, Atlantis	Wesfleur Centre, Atlantis	021 572 7618
Wolvengat	Jenny's Handelaar	Main Road, Wolvengat	028 482 1949

The amount of water pumped through a typical nuclear power station such as the PWR technology is in the order of 76 - 80 m³ per second. For Nuclear-1 it is expected that the water will re-enter the sea at a temperature of 12°C, ambient temperatures been reached within a distance of approximately 300m. The amount of heated water is determined by engineering constraints, but the release point can be designed to maximize rapid dissipation and mixing.

In a nuclear reactor, energy is created through the processes called nuclear fission. A particle called a neutron is used to strike a Uranium atom, where energy is released. The energy released is converted to heat which is used to create steam. The steam is used in the same way it is used in coal and gas powered plants and drives turbines which in turn drive motors to create electricity. The radioactivity from the process is contained in fission products which are retained in the nuclear fuel and does not get released into the environment. Transportation of radioactive material will be subject to NNR and IAEA Regulations on the Safe Transport of Radioactive Materials. These regulations stipulate the type of packaging that must be used, the labelling of the package, allowable modes of transport, etc. Stringent transportation requirements are applied (e.g. transportation packages must be able to withstand conditions such as drop tests from various heights, fire tests, leak test, immersion tests, etc. without releasing the radioactive contents.)

Limited emissions to the air and ocean during normal operation of the nuclear power plant are allowed. The NNR determines the annual authorised discharge quantities of the various radioactive isotopes, based on protecting human health and the environment. These limits set by the NNR are stricter than the international standards (i.e. 250 microSieverts versus 1000 microSieverts internationally). Koeborg has never released more than 1/250 of the allowed limit of the NNR.

To put this into perspective – a flight from Johannesburg to Cape Town will expose you to 15 microSieverts and one chest X-ray will expose you to 200 microSieverts. The background radiation that someone living in



Cape Town is exposed to is 2000 microSieverts a year. People living in Gauteng and Mpumalanga are exposed to 3100 microSieverts a year due to the altitude and less screening of solar

Comment (4):

How much Nuclear waste will these power stations produce over say ten years, where will it be stored, how will it be transported there and how long would it take before this Nuclear waste ceases to be radioactive?

Response (4):

On average about 470 steel drums (low level waste) and 160 concrete drums (intermediate level waste) will be shipped to Vaalputs in the Northern Cape every year.

Maud, Drennan and Partners conducted a preliminary investigation in 1988 with regard to the transport of nuclear waste from the Bantamsklip site to Vaalputs. The results of this study indicates that road transport is the most viable option. Radioactive waste will be required to be transported cross country from the Western Cape to the Northern Cape. The transport mode (road, air and sea) and routing of radioactive waste to Vaalputs will be investigated further in the EIA.

Low-level waste decays to background radiation levels within approximately 30 years, and medium level waste within 300 years.

Comment (5):

Is it true that each Nuclear Reactor would cost in the region of 3 billion rand? This would put us in the region of 15 billion rand if all five are built. With this fabulous budget, is there another non-fossil fuel alternative versus Nuclear? Would the creation and usage of non-nuclear power not get 'better' financial support from the EU (who have made their position on Nuclear Power clear) and other World Organisations as being presently discussed at the Copenhagen Environmental Summit?

Response (5)

Please refer to Chapter 8 Project Alternatives. This document is available at www.eskom.co.za/eia under the "Nuclear1" link. In this chapter, the "No-Go" alternative is discussed, as well as "Alternative Forms of Power Generation" and its application in the South African context. Further, both renewable and non-renewable energy is discussed.

The EU's position on Nuclear Power can be summed up as follows: "It is for each member state to decide whether to use nuclear power. Nuclear power can have an important role to play in the European Union's energy mix: but it is important to continue to address issues surrounding safety and security. In recognition of this, the European Commission has proposed the establishment of an EU High Level Group of national nuclear regulators in order to further develop a common understanding and European rules in the field of nuclear safety and security."

Source: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/10>

Furthermore, the RSA Nuclear Energy Policy was approved by Cabinet in June 2008 and published in Government Notice 1347 contained in Government Gazette No. 31695 of 12 December 2008. The Policy contains clear objectives and principles regarding a nuclear energy programme for South Africa. (Ref. <http://www.dme.gov.za/energy/documents.stm>)

The cost of Nuclear-1 has not been finalised but it is considerably more than R 3 billion rand. Government has, in order to continue the introduction of nuclear generating capacity in South Africa, established a task team, led by the Department of Minerals and Energy, that will work with Eskom, to develop and implement a



framework for procuring a nuclear technology partner to support both the build and associated industrialization process.

Comment (6):

My parents live in Switzerland and were just here for their annual visit. They have cancelled their plans for investing over R2.5 Million in a holiday home in South Africa and buying into the Romansbaai development in Gaansbaai directly due to the proposed Nuclear Power stations as well as Power Lines.

The building of this home, the maintenance, the Swiss Francs and Euros that they would have brought into the Overstrand area which would have provided work and salaries for many is now lost. Friends of theirs who were interested in the idea of living some of the year along such a pristine environmental coast-line and investing into this country and especially this area have cancelled plans to visit the area altogether.

There is no way that Europeans will visit and or invest in this area with power lines marking the sky-line and the knowledge that between 3 and 5 Nuclear Reactors exist using this beautiful ocean as part of the cooling system. Most Europeans are fully aware that the EU has completely ruled out Nuclear Power as a possible future energy resource as well as the reasons as to why the EU took this decision. Most Europeans are fully educated in health concerns regarding Nuclear Power.

Therefore, we ourselves will not continue with the Bed and Breakfast that we have been planning to build and market towards Swiss tourists and will in all probability put our house on the market and move out of the area.

The poor communities in these areas have lost rights towards fishing and self-sustenance via apartheid. The possibility of work and other spin-offs that would come from the fantastic eco-tourism potential of the area will now also be sabotaged.

The value of our property will fall and I have health concerns for my family and children.

For these reasons, we are personally affected and therefore I would like to officially lodge my standpoint against the building of the Nuclear Power Reactors as well as the Nuclear Power Transmission lines and infrastructure within this process of public participation.

Response (6)

We acknowledge your important comment and empathise with your situation. It should, however, be noted that the construction and operation of a Nuclear Power Station will provide many temporary and permanent jobs. Koeberg has created skills and provided jobs, homes and medical facilities. Koeberg employs approximately 1 200 people. Indirectly, the station creates about another 600 local jobs off-site, and about 2 000 jobs in the general South African nuclear industry. In the non-nuclear industry about 100 local firms supply equipment to Koeberg. Various specialist studies will cover aspects of the concerns that you have raised.

Property prices near to Koeberg power station have not declined but have increased in line with the market. Many B&B's operate successful businesses near to Koeberg and in many cases provide a service to visitors to Koeberg.

(Source: http://www.eskom.co.za/live/content.php?Item_ID=548)



Comment (7)

I would very much appreciate your answer as to whether public opinion and participation can have any effect on whether or not the Reactors are built in this area and if at all possible, how much public participation is needed to stop such a project?

Response (7):

One of the purposes of an EIA is obtain comments and input from I&APs. Based on our experience, public input is valued and does make a difference to the actual EIA process. However, ultimately the Authorities make the final decisions and the EIA is used as a tool to assist the Authorities with informed decision making.

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 placed in the public domain for comment. After incorporation and response to the comments received the document will be finalised and a Final EIR submitted to the decision-making authority.

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

