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Attention: St Francis Bay Residents' Association, on behalf of the Thyspunt Alliance

Dear Sir

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

Your correspondence to Ms. Bongji Shinga of Acer (Africa) entitled "Appendix 6, Brief Summary of Initial responses to EIA on Nuclear-1 – Oceanography and Marine Biology" 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.

Your Comment

Please see attached PDF document.

Our Response

Your comments regarding the detail of construction methods for the intake and outfall pipelines are noted. As indicated in the Draft Environmental Impact Report (DEIR) and in all public meetings for the EIA process, the power station design is based on an envelope of criteria, as the specific vendor for the design of the power station has not yet been determined.

The approach that has been followed in this EIA is that instead of specifying specific designs for specific elements of infrastructure (as these are indeed not available), the team of EIA specialists have determined what the environment's capacity is for acceptable change, and to specify this to the engineering team. The engineering team has taken these recommendations and determined whether they are technically feasible. In the case of the pipelines, they will be laid in an excavated trench, which will then be covered.

It is acknowledged that the costs of some of these recommendations will be high. These costs must be internalised into Eskom's planning for Nuclear-1.

Your statements regarding the risks of Tsunamis originating from Antarctica are noted. Tsunamis can be caused by a variety of factors, the most common being earthquakes, landslides and volcanic



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explosions. Undersea earthquakes and volcanic explosions may result in an abrupt deformation of the sea floor and the resultant vertically displacement of the overlying water. Tectonic earthquakes are a particular kind of earthquake that are associated with the earth's crustal deformation; when these earthquakes occur beneath the sea, the water above the deformed area is displaced from its equilibrium position. Antarctica is fairly seismically inactive, with only three volcanic areas, namely the Deception Island, Mt. Erebus and Mt. Melbourn, being seismically active. The seismicity observed in Antarctica is very low in comparison with other continental intraplate regions (Reading 2002¹). Some intra-plate earthquakes have been located in the southern ocean (Kaminuma 2006²) around Antarctica. Most intraplate earthquakes in the ocean surrounding Antarctica are not caused by stress after deglaciation. However, there is a possibility that some earthquakes off of the Antarctic Plate are also caused by crustal deformation /tectonic stress involving de-glaciation. Although it is suggested that the effect of volume and shape change of ice sheet causes crustal uplift, earthquake occurrence, lithospheric deformation, etc. However, no direct relationship between crustal deformation and seismic activity has been demonstrated.

The EIR's treatment of global warming is based on the latest IPCC findings.

The risks related to the marine life at Bantamsklip and Thyspunt are acknowledged and are dealt with in detail in the marine impact assessment. Both the presence of Abalone at Bantamsklip and Chokka squid at Thyspunt are treated as potentially significant impacts, and detailed recommendations are made regarding the depth and distance offshore for the release of warmed cooling waster to ensure that these impacts are mitigated. Impacts related to the marine disposal of spoil on these marine resources are also investigated in this study.

As indicated above, the approach of this EIA was for the EIA specialists to specify criteria to ensure that the impacts are acceptable from the perspective of the specialists. This is also the case for the marine disposal of spoil. Distances and depths at which the spoil should be disposed to ensure minimal impact on critical marine organisms such as abalone and chokka have been specified.

Should you have any queries with respect to the above please do not hesitate to contact Arcus GIBB.

Yours faithfully
For Arcus GIBB (Pty) Ltd



Jaana-Maria Ball
Nuclear-1 EIA Manager

¹ Reading, AM (2002) *Antarctic seismicity and neotectonics*. In: Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin, 35 .The Royal Society of New Zealand, Wellington, NZ, pp. 479-484. ISBN 1-877264-06-7

² Kaminuma, K. 2006. *Seismicity in the Antarctic and surrounding ocean*. In: J. Ind. Geophys. Union (March 2006). Vol.10, No.1, pp.15-24

Brief summary of initial responses to EIA on Nuclear 1 – Oceanography and Marine Biology.

In order to properly respond to any EIA, there is a requirement is to know exactly what is being proposed. The three sites covered in this EIA, Duynfontein just to the north of Koeberg nuclear power station, Bantamsklip, between Shelly Beach and Quoin point on the SW Cape Coast and Thyspunt, between Oyster Bay and Cape St Francis in the Eastern Cape are all treated in an extremely general manner, without any specifics as to the final designs, construction methods, and as far as the oceanographic and marine biology aspects are concerned, how the intakes and outfalls are to be constructed on the sea bed and many other details required in order to form properly informed opinions.

A nuclear power station is a complex piece of machinery. The infrastructure required to build these particular units proposes the use of sea water to cool the reactors. Whereas Koeberg uses a form of harbour as a basin for the intake water and a pipeline for the hot water outfall, the proposal for the Nuclear 1 design – which is not decided on as to the final type, manufacture, capacity or design – is to use undersea tunnels of up to 2km to both supply this cooling water and to remove and disperse the hot water from the plants.

As there are no design parameters, there is a complete lack of detail in how the pipeline/ tunnels for the intake and exhausts are to be constructed, how they will be secured to the sea bed, or any other such detail. Bantamsklip is mostly reef, with very little sand cover to bury any proposed tunnel/ pipeline and appears to be completely non-viable. The sewage outfall pipeline off Green Point is built in similar, but far lower energy conditions, and failed soon after being built. Consequently it is impossible to come to any sort of informed conclusion as to the impacts, safety, security of the construction of these feats of engineering.

There has never been any similar scale of undersea construction undertaken in South Africa. We must remember that all three of these sites are on some of the highest energy coastlines in the world, which face the full power of the high latitude anticyclones of southern ocean, which are amongst the most powerful storms on earth, far more powerful than tropical hurricanes. The energy from these storms makes the likelihood of securely constructing these proposed tunnels/ pipelines extremely challenging, which may be why the consultants have failed to provide any detail on the construction of this aspect of the plants.

The costs associated with the construction of these feats of engineering will be extremely high and are extremely likely to incur high cost overruns due to technical challenges related to construction. The future maintenance of these pipelines could also prove an extensive future cost and may result in high likelihood of plant shut-downs due to damage to the tunnels.

Beside these fundamental flaws in the parameters of the EIA related to this Nuclear 1 project, there are many other serious issues that are not properly dealt with in the EIA. While the risk of tsunamis has been dealt with in a limited way, the risk of tsunamis originating from Antarctica, where global warming threatens the ice cap in future and where melting of any significant amount of ice will cause geological displacement, resulting in possible seismicity, is not dealt with at all. As these sites are generally southerly oriented this is another fundamental flaw in this EIA.

The risk of global warming is extrapolated from the UN International Panel on Climate

Change (IPCC), which is, generally speaking, a conservative document. Consequently the risks and impacts related to climate change in the EIA tend to be conservatively stated and worst case scenarios, such as runaway climate change related to feedback mechanisms coming into play, are not meaningfully covered or dealt with.

There are also serious biological risks. Bantamsklip is located in the middle of one of the last remaining strongholds of Abalone/ Perlemoen (*Haliotis midae*) on our coastline. It is also surrounded by a significant proportion of kelp beds which could be impacted by the heated water plume from the power station. Thyspunt may hold threats to the local chokka squid industry and fishers are justifiably concerned by this threat, which may be measurable from a radiological perspective but which will more likely be impacted by risk related to perceptions about the quality of this product.

There are several other serious shortcomings in the EIA related to the aspects of the marine biology of this project. These include stability of the ocean bottom around each of these sites, which is not dealt with sufficiently. The risk and threats from the proposed dumping of vast amounts of spoil from the land based construction of the sites at sea adjacent to these proposed sites is not adequately dealt with, again especially in light of the fact that the final design of the nuclear reactors is not yet agreed upon.

If one only considers the construction of any of the three options of Nuclear one from an oceanographic perspective it is our informed opinion that not only are there significant risks which are not adequately addressed in the EIA specialist studies, but that the final construction of the proposed marine component of these power stations – the undersea tunnels/ pipelines – will increase the cost of the project to such a degree as to make the project non-viable from an economic perspective.

If we include the myriad other environmental risks involved in the marine and oceanographic aspects of the construction of Nuclear one, there is clearly inadequate justification to build these power plants from a sustainability, cost, economic or social perspective. These projects should be shelved forthwith in favour of the no-go option, which is the only real alternative to the proposed construction of these plants.

Preliminary report compiled, without prejudice, by Glenn Ashton, Ekogaia Consulting.