5 August 2015

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Your Ref: Email received 03 August 2011

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Dear Ms Jephson and Mr Laubscher

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

Comment 1:

Our position remains unchanged with regard to our objection to the proposed nuclear power station at Bantamsklip. All our previous comments are still applicable including that below.

Comments Regarding the Revised Plan of Study for Nuclear Power Station Bantamsklip.

Regarding the siting of Nuclear 2 at Bantamsklip

Eco-tourism impact: It is completely unacceptable to have a nuclear power station in the middle of an eco-tourism hot spot area, which constitutes a major portion of the economy of the Southern Overberg. This is not an industrial area and as such is completely unspoilt by any form of industrial activity. The area has spent millions over the past 30 years establishing itself as the whale, shark and fynbos eco-tourist destination as well as wine and heritage tourist destination of national and international renown. It relies on natural beauty and the unspoilt openness of the landscape and coast in its appeal. According to the Scoping Report a nuclear power station here will have little to modest impact on tourism. This is a completely erroneous supposition, which has no basis in fact, and the EIA is urged to properly assess the tourism impact thoroughly.

Response 1:

Please note that this application is for Nuclear-1, not Nuclear-2 as indicated by your comment.

Your comments regarding the findings of the Tourism Impact Assessment (Appendix E22 of the Revised Draft EIR) are noted. Should you have any evidence to support your comment that the findings of the tourism assessment are erroneous and not based on factual research, kindly provide such evidence. Whilst the establishment of a power station may have a negative impact on nature-based tourism, the Tourism Impact Assessment assesses the positive and negative impacts on tourism, including the expected increase in business tourism associated with the construction and

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A list of divisional directors is available from the company secretary.

operation of the proposed power station. The Tourism Impact Assessment therefore assessed the net impact that Nuclear-1 is likely to have on the tourism industry.

Comment 2:

Food production impact: The Overberg in addition to being a tourist hot spot is also a major food producing area with beef, lamb, dairy, wheat, canola, grapes being some of its main agricultural activities. Of major concern is the health of plant, animal and human life with Strontium-90 and Cesium-137 emissions, which are released by nuclear fission into the air, water (both fresh and sea), by deposition to land and thus into the human food chain. Some farms within a radius of 20 km of Bantamsklip or more will not be able to continue marketing their food crops because of this danger. Since we live in a world where food crops are becoming less and less available and there is a dire need to encourage farming to meet human food needs it is completely unacceptable that a nuclear facility is being positioned within a food-farming zone, thereby rendering the area non-agriculturally sustainable. The agricultural soils of this area are some of the cleanest, being free of fertilizer and herbicide chemicals. Many meat and dairy farmers practise organic farming activities, with free range, grass-fed cattle and sheep. Certification for organic farming would be rendered impossible as a consequence of a nuclear facility nearby.

Response 2:

Your comments that organic farming would no longer be able to occur in proximity of a nuclear power station are not supported by fact. The Agricultural Impact Assessment (Appendix E21 of the Revised Draft EIR) assessed whether proximity to a nuclear power station would preclude organic certification. Certification bodies for such organic certification schemes confirmed that proximity to a nuclear power station would have no impact on the certification. This is borne out by farming activities that continue around Koeberg Nuclear Power Station, including organic wine farming that takes place within sight of the KNPS.

Your comments regarding Strontium-90 and Cesium-137 are noted. The exact source of radiation (i.e. the isotopes that give rise to radiation) is not material to health effects. Rather, the effective cumulative dose of radiation from all possible sources determines whether or not impacts can be expected to occur in the food chain. To isolate specific isotopes of Strontium-90 and Cesium-137 is therefore immaterial to the question of whether or not health impacts could be expected. Experience with the KNPS, which uses much older technology than will be employed for Nuclear-1, indicates that the effective cumulative dose from all sources of radiation is negligible.

Comment 3:

Export cut-flower impact: In addition to eco-tourism and food farming, cut-flower harvesting constitutes a third major economic force in the area. The Southern Overberg and the Agulhas Plain, which has its own Agulhas National Park, is the fynbos eco-destination of the world and cut-flower production is practised in addition to eco-tourism as a means of generating an income on fynbos farms. These farms form a complement to the food-producing farms and often have more mountainous areas than arable land with 'virgin fynbos' protected by government legislation. Incentives are given to farmers to develop protea/fynbos orchards for the cut-flower export market and to remove alien vegetation to protect and preserve the natural fynbos veld. To meet the stringent European Union cut-flower import regulations, all flowers have to be tested and proved free of harmful chemicals. It is then highly questionable as to whether any export flowers from this region will be

acceptable by the EU or the USA, when they are found to have been contaminated by radioactivity. This is another flourishing and important economy of the area which would be rendered un-viable by the negative impact of a nuclear power station at Bantamsklip. One only has to look at the devastation caused by the Overberg fire of 2006 to see how it collapsed the cut-flower market and caused untold people to lose their jobs.

Response 3:

Please refer to our response above regarding organic farming.

Comment 4:

Human health impact: The lack of any major industry in the Southern Overberg means the area is free of associated water and airborne pollutants. Building a nuclear power station within this 'pollution free zone' – with all its associated radioactive waste activities and emissions is completely unacceptable. The negative impact on human health will be critical and it is a well-proven fact that radioactive emissions cause various forms of cancer. Of particular concern are the long-lived isotopes Strontium-90 and Cesium-137, which both have half lives of up to 30 years and which attack the bone and tissue cells. In support of this argument please find attached with this letter, various articles, which – contrary to Eskom's claim that Nuclear Energy is safe – say exactly the opposite. The [United States] NRC publishes values of radionuclides that should not be exceeded by ingestion or inhalation in the course of a year to minimize any biological effects from radiation doses absorbed by tissues. The annual limit of intake (ALI) for Cs-137 is 100 micro-Curies or 3.7 million Bequerels for ingestion and 200 micro-Curies or 7.4 million Bequerels for inhalation.

http://www.uspharmacist.com/index.asp?show=article&page=8_1324.htm

Response 4:

Please refer to our Response 2 above regarding the emission of Strontium-90 and Cesium-137.

Radioactivity can cause cancer at high doses. A measure of the risk of biological harm is the dose of radiation that the tissues receive. The unit of absorbed radiation dose is the sievert (Sv). Since one sievert is a large quantity, radiation doses normally encountered are expressed in millisievert (mSv) or microsievert (µSv) which are respectively one-thousandth or one millionth of a sievert. The public dose limit for radiation in South Africa is defined by Regulation 388 of April 2006 under the NNR Act, 1999 (Act No. 47 of 1999) at 1 mSv (1000 µSv) per year. This is a limit applied internationally for the protection of human health from exposure to ionizing radiation.

On average, human radiation exposure due to all natural sources amounts to about 2.4 mSv per year. This is called natural background radiation. This figure can vary, depending on the geographical location, by several hundred percent. By far the largest source of natural radiation exposure comes from varying amounts of uranium and thorium that occur naturally in soil. The average background radiation dose in the United States is 3 mSv per year and the average dose for airline crews (due to increased exposure to cosmic radiation at high altitudes) is between 2 and 4 mSv per year.

The graphic on the next page illustrates the effects that a range of radiation doses can have on the public and from which levels health effects can be expected. As indicated by this graphic, the United States Environmental Protection Agency's guideline for lifesaving is 0.25 Sv and there is evidence that

health impacts from radiation can occur from 0.1 Sv (100 times greater than the general public dose limit). However, given the public's exposure to radiation doses of less than 1 mSv around nuclear power stations, there is no evidence to suggest that the public living in proximity to nuclear power stations is exposed to an increased risk of cancer.

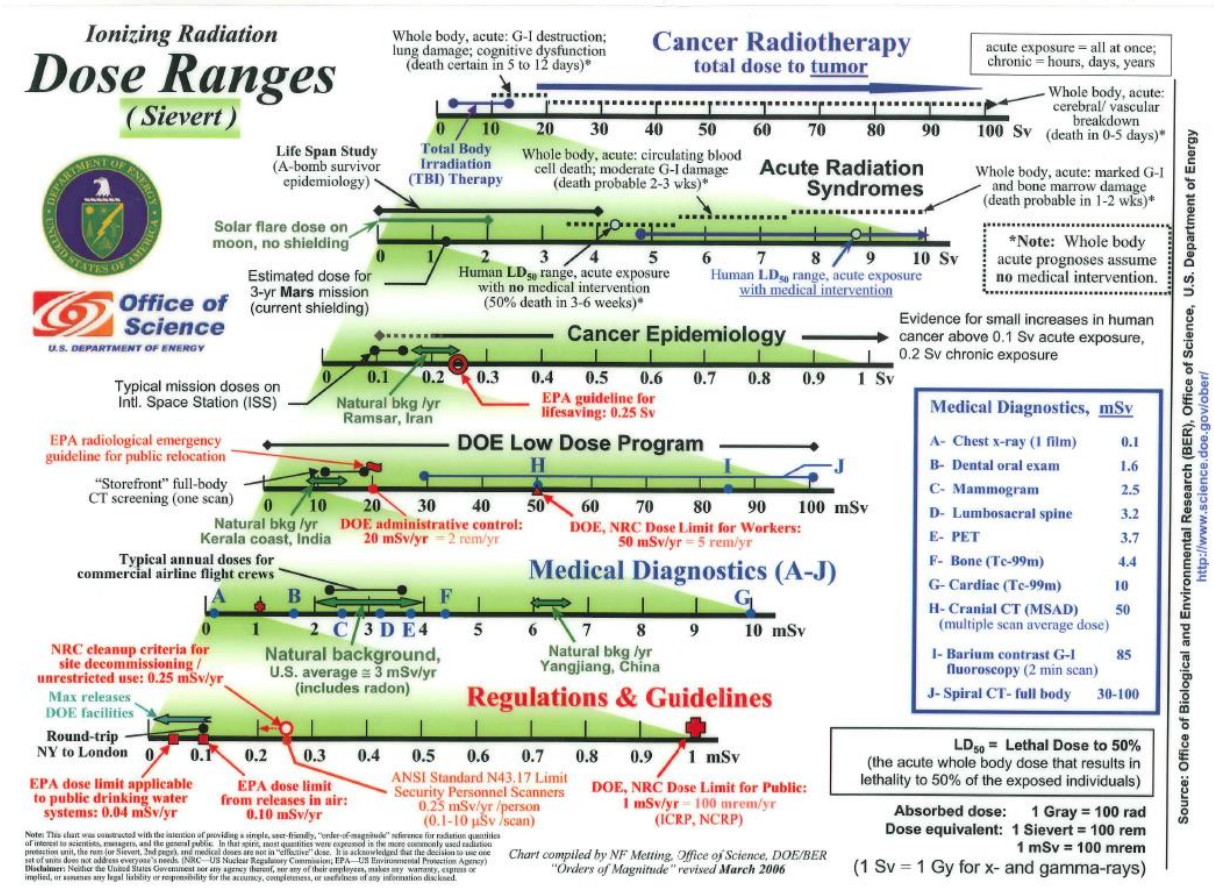
ADDITIONAL COMMENTS FROM INDEPENDENT NUCLEAR SPECIALIST

Radiation risks are assumed to be stochastic in nature the associated causality and nuclide specific characteristics are secondary to the received dose and target tissue sensitivity and hence the adoption of the linear no threshold principle to radiation protection and the adoption of dose limits as opposed to nuclide limits - adoption of nuclide specific discharge limits are secondary limits to ensure the achievement of the primary dose limits everything which is proposed is in line with international best practice and scientific evidence and recommendations.

Comment 5:

Economic impact: Most of the local communities and the labour force of the Southern Overberg are involved in tourism (marine and terrestrial), farming and/or cut-flower production. Should this nuclear power station be erected, all these economies will suffer, and the very basis for the Overberg's existence will be wiped out. Job losses, loss of sustainable livelihoods and loss of property values will be just a few of the ramifications, which will destabilise the area. In short the Overberg will no longer have a value. To quote from your own document:

"It is possible that the normal operation of a reactor at Thyspunt and Bantamsklip could limit future tourism development with significance for the local and provincial economies. A substantial nuclear incident could have significant economic costs for tourism and the associated Eastern Cape and Western Cape economies." (NUCLEAR 1 ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME SPECIALIST STUDY FOR SCOPING REPORTSPECIALIST STUDY: TOURISM Page 16.)



Response 5:

Your comment is noted. The Tourism Impact Assessment (Appendix E22 of the Revised Draft EIR) concluded that there would be a net benefit to tourism in the Bantamsklip area of around 5% during the construction phase of Nuclear-1 and a net benefit of around 8.5% during operation. As indicated in Response 1, this prediction takes into account the potential negative impact on nature-based tourism and the potential positive impact of business-based tourism.

Comment 6:

Health and Safety of Nuclear Power: We would like to analyze some answers which Eskom gave regarding questions at the original scoping phase of this EIA. The blue text represents Eskom's answers; the red text represents the response of the Coalition against Nuclear Energy (CANE). Reading these responses, one is not at all reassured that Eskom in fact knows what they are talking about.

ESKOM: "Eskom will not construct and operate a nuclear power station if it is not safe."

CANE: the very concept of what constitutes safety and who decides what constitutes a reasonable risk is what the argument is all about.

Response 6:

Your comment is noted. Please refer to Response 4 above regarding the internationally agreed measures of radiation safety. As indicated by this response, the public dose limit for radiation in South Africa is 1 mSv (1000 µSv) per year. Records indicate that the Koeberg Nuclear Power Station has consistently remained below this dose limit throughout its operation.

Comment 7:

ESKOM: "In addition, the nuclear safety of, and the risk of a nuclear accident at the proposed power station will be independently assessed by the National Nuclear Regulator. The NNR will only issue a nuclear installation license for the proposed power station if it is satisfied that the risk of an accident is acceptable low."

CANE: This delays the argument to another occasion, while the integrity and independence of the NNR is also under question. ESKOM must answer the question.

Response 7:

Your comment is noted.

Information about radiological emissions under normal operating conditions is provided in the EIR and the environmental impacts of these emissions are assessed. However, assessment of the radiological emissions during emergency events and the readiness of the relevant role players to deal with such events is clearly within the ambit of the NNR owing to its legal mandate in terms of the National Nuclear Regulator Act, 1999 (Act No. 47 of 1999).

As with many different forms of development, construction is dependent on authorisations by a number of different legal entities, including local, provincial and national authorities. Construction of such developments is reliant on all these authorisations being obtained from entities with vastly different legal mandates. Reporting requirements to satisfy all these authorisations vary hugely, and it cannot reasonably be expected that information relevant to all these authorisations should be contained in the EIR.

ADDITIONAL COMMENTS FROM INDEPENDENT NUCLEAR SPECIALIST

This is a statement of the requirements upon which such processes are based - until such time as a licence application is made the specify licence requirements cannot be established.

Comment 8:

ESKOM: "Experience gained internationally is that people do not become ill or die from living in close proximity to a nuclear power station."

CANE: This is a blatantly false answer. See the response of Dr Leslie London with regard to the original PBMR EIR. See also Elizabeth Cardis et al, Ernest Sternglass, Rosalie Bertell, etc. etc

Response 8:

Your comment is noted. Should an interested party be able to provide scientifically verifiable evidence of proven health impacts for people who live in proximity to a nuclear power station, then such claims can be considered. However, the overwhelming consensus of scientific judgment is that the radiation dose limits applied to populations around nuclear power station provides more than sufficient safety.

Comment 9:

ESKOM:"Taking Koeberg as an example: Koeberg has operated for the past 23 years within very close proximity of wheat, cattle and dairy farms. The nearest farms are within 10 km of Koeberg"

CANE: No independent epidemiological studies have been done on the cancer rates before and after Koeberg was switched on.

Response 9:

Your comment is noted. It stands to reason that if health impacts from the Koeberg Nuclear Power Station (KNPS) were being experienced, it would have been highlighted by the public or by the National Nuclear Regulator. However, there is no evidence of such deleterious health effects having occurred.

Comment 10:

ESKOM: "Everybody is exposed to natural background radiation everyday from, for example, the earth itself, the materials from which buildings are constructed, the sun, and on a less regular basis from medical exposures (X-rays)."

CANE: This is a red herring, designed to obscure the scientific facts. We are NOT talking about background or external radiation: we are talking about man-made, INTERNAL DOSES of ionizing radiation.

Response 10:

Should you have any scientifically verifiable evidence to suggest that background radiation does not exist, we would welcome the opportunity to interrogate such evidence. As indicated in Response 4, natural background radiation accounts for a greater portion of radiation to the general public than radiation from power generation sources.

Comment 11:

ESKOM: "The quantity of radiation exposure and what is absorbed by the body is measured in micro Sieverts (μSv) per annum. The National Nuclear Regulator (NNR) sets the limit of exposure arising from operations at nuclear installations. Hence the limit for Koeberg is set at 250 μSv per annum, far below the exposure from natural background radiation (which is about 2500 - 3000 μSv per annum), and less than the international standard of 1000 μSv per annum. The Koeberg Nuclear Power Station has been in operation for over 23 years - the public exposure to radiation as a result of Koeberg's operations has been less than 20 μSv per annum in general and less than 6 μSv per annum in 2005/6

- reference NNR Annual Report 2005/6 tabled in Parliament - available off the NNR website www.nnr.co.za), far below the limit set by the NNR."

CANE: This is a completely irrelevant red herring. We would like to know about the projected output of Strontium-90 and Cesium-137 in Becquerels per annum INDEPENDENTLY VERIFIABLE by reference to an EXISTING technology such as the proposed AP1000 and EPR reactors. We cannot accept any other irrelevant references, since we have no SCIENTIFICALLY VERIFIABLE EVIDENCE on what is expected to come out of THESE SPECIFIC, NAME-BRAND reactors. You cannot measure exhaust fumes from a new BMW Z4 by using a 1976 VW Beetle as a reference! Nor can you refer to lead poisoning from pencils as a reference with regard to bird droppings in the garden! Let's have the actual facts, not obfuscation and technical garbage.

Response 11:

As indicated in Response 2 above, the origin of the radiation is immaterial to but the total cumulative dose (the "radiation output") is important.

To use CANE's vehicle analogy, the mechanics of a vehicle's drive train are unimportant, as long as its exhaust emissions remain below the legal limit. The brand name of the proposed nuclear power station is therefore not required. All the commercially available Generation III nuclear power station designs being considered are designed to limit radiation emissions to below the public dose limit.

ADDITIONAL COMMENTS FROM INDEPENDENT NUCLEAR SPECIALIST

Whilst what is said is correct it will be a requirement of the nuclear license application that the design specific situation be assessed and it is likely that this will be done against a reference design - what appears to be being stated not unreasonably is that the operating envelope of any new technology will be well within that of the existing technology - in any event the regulatory requirement will be that doses must be below limits and ALARA and that there is no reason not to expect that the potential designs under consideration will not meet this requirement.

Comment 12:

ESKOM: "Samples of fish, meat, vegetables, milk, water, etc are regularly collected from the area around Koeberg and analyzed to determine any possible effects on the food chain. Samples are also sent overseas for independent analysis and proof that Eskom is operating within the required limits."

CANE: And the results show what? How many Becquerels per kilogram (or per litre) per annum? We're not interested in microSieverts, or whether unnamed "overseas experts" may be considered by definition to have integrity and independence. Show us the unadorned facts.

Response 12:

As indicated in the Marine Ecology Assessment (Appendix E15 of the Revised Draft EIR), human activity has resulted in varying degrees of contamination of the world's marine environment with anthropogenic radionuclides since the 1940s. Globally, the primary source of this contamination is fallout from over 520 atmospheric nuclear weapons tests (Friedlander et al. 2005). These radionuclides now occur alongside naturally occurring radioactive compounds at varying concentrations throughout the world's oceans. In a recent review of radionuclides in the marine

environment Friedlander et al. (2005) report the occurrence of a number of these compounds in marine organisms. Specifically, Cesium (Cs-137) and Strontium (Sr-90) have been found in bivalves along the west and east coast of America, in fish, mollusks, algae, seawater and sediment in Japan, in fish, seawater and sediments from the Arctic and related seas, and in fish, mollusks and crustaceans in the north Atlantic region. Equivalent data are not available for the southern hemisphere.

Comment 13:

ESKOM: "Although the risk of an accident is very low, the National Nuclear Regulator (NNR) nevertheless requires emergency planning to be undertaken."

CANE: We are not interested whether the risk is high or low. All we are interested in is an honest and scientifically verifiable example of the impact of a major accident on the INES-7 Scale. Give us the facts.

Response 13:

INIS (the International Nuclear and Radiological Event Scale) is a worldwide tool for communicating to the public in a consistent way the safety significance of nuclear and radiological events. Just like information on earthquakes or temperature would be difficult to understand without the Richter or Celsius scales, the INES scale explains the significance of events from a range of activities, including industrial and medical use of radiation sources, operations at nuclear facilities and transport of radioactive material.

Events are classified on the scale at seven levels: Levels 1-3 are called “incidents” and Levels 4-7 “accidents”. In this case level 7 is a major accident, similar to Chernobyl in 1986 with widespread health and environmental effects and external release of a significant fraction of the reactor core inventory.

ADDITIONAL COMMENTS FROM INDEPENDENT NUCLEAR SPECIALIST

This is the internationally accepted standard - the description of the types of events covered by each category are covered in the scale definitions themselves - generally events of INES level 4 and above are within the ambit of the emergency planning arrangements - the IAEA factsheet in this regard can be found at http://www.iaea.org/Publications/Factsheets/English/ines.pdf

Comment 14:

ESKOM: "For the proposed nuclear power station Eskom is considering the latest design of Pressurized Water Reactor (PWR) technology. Internationally, these designs have formal emergency planning zones less than 16 km."

CANE: We are indifferent to "international" standards. What does INES-7 tell us about the scale of a major accident? How far will the radioactivity from Cesium-137 stretch in kilometers, using that event of April 1986 as a benchmark? Why were all foodstuffs taken off the market for many thousands of kilometers away? What was the measurable impact on the reindeer economy of Northern Scandinavia? What was the impact on lamb and mutton production in Wales? How far afield were wild

mushrooms and berries affected? Let us use this verifiable and scientifically testable data and apply the answers logically and without obfuscation to the impact of a major accident at Bantamsklip.

Response 14:

EPZs for the new nuclear power station are considered 800 m and 3 km respectively. The reduced EPZs are based on European Utility Requirements (EUR) standards, which prescribe that modern nuclear power plants should have no or only minimal need for emergency interventions (e.g. evacuation) beyond 800 m from the reactor.

The basis for adopting the EUR by Eskom is that the EUR aims at ensuring that the design that is adopted has minimal impact on the man and environment. This has been developed by utilities who will, in any case, have their design studied and endorsed by the relevant regulatory body. If the final design does not conform to the assertions made, the design will not be accepted and might have to be modified accordingly until it conforms to these requirements.
Thus, the key emphasis of this requirement is to minimise the impact on man and environment. Eskom has chosen the EUR as this specification is sound and robust. It also allows for alignment with the international nuclear community.
The Emergency Plan boundary allow for minimal restrictions around the site, while also providing for safer designs

Comment 15:

ESKOM: "The NNR will however determine the emergency plan requirements and the extent of the required zone based on a safety assessment of the design of the proposed nuclear power station and the proposed site and surrounds."

CANE, MK: Irrelevant. We are not interested in what NNR has to say. What do Eskom and Arcus Gibb have to say?

Response 15:

Please refer to our Response 7 and 14 above. Emergency Planning is within the ambit of the NNR's nuclear licensing process and is not required to be addressed in detail in the EIA process.

Comment 16:

In Conclusion: we wish to say that a nuclear power station at Bantamsklip is not at all acceptable and we totally oppose it. We would urge Eskom to look at clean, renewable forms of energy that will do the minimum of harm to human and animal health and have the least impact on all aspects of the environment and tourism. Clearly a nuclear power station will have the opposite, having a major, dirty, unsafe and prolonged damaging impact.

Response 16:

Your comment is noted.

The IRP 2010 evaluated several energy mix options and concluded that all forms of energy were required to meet the electricity demand in the future. Eskom is investing in renewable energy.

Yours faithfully
for GIBB (Pty) Ltd

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The Nuclear-1 EIA Team