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09 January 2010

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Attention: Mr R. Mike Longden-Thurgood

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED ESKOM NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE: COMMENTS ON THE FINAL SCOPING REPORT

Dear Mr R. Mike Longden – Thurgood

Your correspondence to Ms. Bongi Shinga of ACER (Africa) entitled "Eskom Nuclear-1 Project - Comments on the Final Scoping Report**"** refers.

Arcus GIBB acknowledges receipt of the above-mentioned letter and documentation. We thank you for your valuable comments and your participation in the Eskom Nuclear Power Station (NPS) Environmental Impact Assessment (EIA) process to date.

1 MAIN REPORT

Your comment (1)

1 **P.35 Final DSR List of abbreviations:** U**3**O**8** is referred to as "*Uranium oxide*". In actual fact, uranium has *three* stable oxides, the other two being UO**2** and UO**3**, the di- and tri-oxides, respectively. Instead of referring to U**3**O**8** as "uranium oxide" (it certainly is an oxide of uranium, of course), it would be more relevant to describe it as "The naturally occurring oxide of uranium, one of three stable oxides". This would be perfectly well understood, rather than use its chemical name, it being regarded as a mixture of UO**2** and UO**3**.

Although, to be strictly accurate, it should be referred to as "triuranium octoxide", I definitely don't recommend adherence to this strict chemical description for the purposes of this current document.

2 **P.56 Section 3.8 Assumptions and limitations, quoting the 1st para:** "*The* [sic] *section briefly outlines - - - - Scoping report. It should be noted that - - - - and thus some of the limitations indicated below will no longer be addressed through further assessment during the detailed assessment phase of the EIA process*".

To make this sentence a little more meaningful, I suggest that it is reworded as follows**:**
*"**This** section briefly outlines - - - - Scoping report. It should be noted that - - - - and thus some of the limitations, **as are identified below,** will no longer be addressed through further assessment during the detailed assessment phase of the EIA process"*

3 **P.63 Section 4.4.5 Spent Fuel Storage 1st para 4th line:** the phrase "- - - *be shielded from people*" would be more meaningful if it was reworded as follows**:** "- - - *be shielded in order to prevent any unacceptable exposure of radiation workers to ionizing radiations*".

No one but radiation workers should be allowed anywhere near to any sources of radio-activity, whether in storage or not, unless accompanied by properly qualified radworkers, and having first been issued with temporary radiation exposure monitoring devices, such as film badges or thermoluminescence dosimeters.

4 **P.84 Section 4.11:** The heading to this section is given in the form of a question. Even though this document is intended to convey information to people who are not highly conversant with nuclear technology and licensing requirements, it isn't intended to be a pop document, or the "Frequent questions" session for a website. Because this heading in its present format could even get transposed in the same format to the Draft and Final EIRs, I suggest that it be reworded as follows**:**

"4.11 Licensing and regulation of nuclear power stations in South Africa by the National Nuclear Regulator (NNR)"

5 **P.85 3rd complete para, quoting:** "*For each stage (such as bringing nuclear fuel on to the site, loading fuel into the reactor, taking the reactor critical) commercial (generate electricity), the license will contain - - -*". I don't want to be critical of the English because it's the technology which is of concern from the point of view of this EIA process. However, because this part of the paragraph does read rather problematically I feel obliged to suggest this alternate phrasing**:**

*"For each stage of a completed reactor (e.g. fuel transport to the power station**;** loading fuel in the reactor core**;** first criticality), and commercial operation (i.e. electricity generation), the license will contain - - -".*

6 **P.85 Para immediately preceding Section 4.12, last line, quoting:** "- - - *installation license end 2008 coinciding with the - - -*". I don't recommend adopting SMS shorthand for official documents! Rewording as follows would make it properly meaningful: "- - - *installation license at the end of 2008, coinciding with the - - -*".

Response (1)

Thank you for all your suggestions. It is noted that none of the suggested changes are substantive. Although your comments are deemed valuable, Arcus GIBB will not make any textual changes to the document as the document has been accepted by the Department of Environmental Affairs (DEA). Comments raised regarding the FSR will be addressed as far as possible in the Draft Environmental Impact Report (DEIR).

Your Comment (2)

7 **P.86 Section 4.12 Decommissioning, Safe Storage and Entombment:** there's no indication in this section that the decommissioning process - and reversion to "greenfields" if this is considered to be necessary a long time into the future - isn't a relatively short term situation. It is long term, in fact**:** reckon on between 50 to 60 years. Despite whatever the nuclear opponents might consider, now, to be a major problem of the disposal of irradiated fuel elements into permanent repository storage ("entombment") asap, in the event, the outcome is likely to be rather different. The sensible way will be to make the best use of whatever trans-uranium nuclides are present in the irradiated fuel elements for the future generation of fast breeder reactors. The fuel elements will need to be chemically processed to separate out the unused U-235, U-238, and the transuranics, leaving a residue of whatever the list is of long lived fission products, and it will be this final radioactive residue which would then need to be put into

permanent repository storage. This will also include the final residues of nuclear fuel as used in the HTRs, of course.

In expressing this viewpoint, I necessarily make two assumptions**: first** that it will still be a number of decades before thermonuclear power becomes a commercial source of energy for electrical generating purposes**; second**, unless thermonuclear reactor cores can be designed in a way that will allow them to be used to generate hydrogen energy-economically for the future non-carbon "hydrogen energy economy" (especially for running motor vehicles), both pebble bed and fast breeder HTRs will be needed for this hydrogen production. Thus they will require nuclear fuel for possibly as long as the next 300 years, and in addition utilizing the currently unused thorium 232, which is more abundant than natural uranium, at least before mining the latter commenced. Thereafter, I wouldn't dare forecast how the world's manufacturing and general purpose energy requirements will be provided.

In being too dogmatic in this report about the eventual entombment of irradiated fuel elements, although it may placate the nuclear opponents, it will be doing so for quite the wrong reasons.

Response (2)

Your comment is noted. As you have indicated, decommissioning is not a "relatively short term situation"; given that the life of a nuclear plant can be extended to 60 years. Currently decommissioning of nuclear plants is being practised internationally and can only improve further into the future. We have just learned about Areva's successful dismantling and packaging of the reactor pressure vessel internals in the 660 MWe pressurized water reactor at Stade in Germany. The project was completed on 26 May 2009. It took a team of thirty Areva specialists twelve months to dismantle the upper and lower core support structures including the core stool and to package these in purpose-built final storage containers. Engineers and experts from its customer E.ON Kraftwerk also participated in the process, as did the TÜV technical inspection agency.

As you have indicated, novel reactor systems are continually being wit the aim of improving the efficiency uranium usage as well as investigating the opportunities to use thorium (three times more abundant than uranium).

Your comment (3)

8. P.151 Fig.50 has the caption "*Surface water catchments associated with the Bantamsklip site (SRK, 207a)*". However, the map provided is that for the *Brazil* and *Skulpfontein* sites!

Response (3)
Error noted. This will be corrected in the Draft EIR.

Your comment (4)

9 P.160 Sub-section (i) Tourism: I recall reading in a recent newspaper that there were a number of concerns about both the Bantamsklip and Thyspunt sites, partly because of endangered flora, but also for recreational reasons. I didn't note the information given in detail. For Bantamsklip there is no indication in this section what the impact the seawater intake basin would have on local tourism and recreation. This basin would, I assume, certainly not be any smaller than that one at Koeberg.

Means would presumably have to be provided to prevent whales from entering the basin. In addition, what effect would this basin have on the recreational activity of whale watching? Would it be designed to allow for public access round its top?

The eventual close proximity of a nuclear power station to existing local tourist facilities may discourage a lot of people to want to visit the facilities, partly because of fear of nuclear power, and also because of the gross visual intrusiveness. The owners of the facilities could incur heavy losses in income.

How would this situation intend to be addressed by Eskom? It hasn't been dealt with in this FSR.
Please note that I have no pecuniary interests in any tourist facilities, either here or any-where else.

Response (4)

With respect to the final design of the nuclear power station – these plans have not been finalised as they will be dependent on the outcomes of the EIA as well the final plant type selected.

The potential impact of the proposed Nuclear Power Stations (NPSs) on whales and other marine life will be assessed in the marine specialist study. Whales can be seen seasonally from the Koeberg Power Station. No provision has been made as yet for the viewing of whales from the proposed NPS. For security purposes strict control of the public entering onto the site must be maintained. The site is relatively small and the whales will be viewable from numerous other locations.

Independent studies are being undertaken by specialist whose reputation, commitment to the environment and legal obligations would not permit them to hide any potentially negative information. The National Government, who are responsible for accepting or rejecting the EIA, could not afford to allow an unsafe activity to be authorised.

Your comment (5)

10 P.173: The block on this page for Fig.62 is blank.

Response (5)

Thank you for pointing this out. Figure 62 is "Surface water catchments associated with the Thyspunt site".

Your comment (6)

11 P.184 Sub-section (i) Tourism: exactly the same comments apply here as for item 9 above.

Response (6)

See response to Response 4 (Item 9) above.

Your comment (7)

12 P.198: reference is given to the url http://www.info.gov.za/aqsgisa/asgisa.htm, which is dated May 2007. In the interim, has it been modified in view of the problems with energy supplies?

Response (7)

Asgisa still identifies a drive for a 6% growth in GDP which translates into a 4% increase in the demand for electricity. Moreover, despite the current recession, a situation which is viewed as temporary, South Africa is still experiencing low reserve margins and therefore shortage of electricity supply during certain times of the year specifically during the peak demand period.

Your comment (8)

13 P.203 Section 8.3.3 OCGTs, quoting: "*The OCGTs differ from the CCGTs in that air that passes through the turbine- - -*", etc. This latter part of the paragraph needs to be reworded to bring the information up to date with the projected conversions of the OCGTs to CCGTs. I don't think that I need to suggest a rewording format.

Response (8)

This will be addressed in the Draft EIR if the OCGTs are discussed. .

Your comment (9)

14 P.209 Sub-section (ii) Disadvantages (of solar concentrating): One of the disadvantages is given as "*Without battery storage, the energy is not available all the time*". I think that some more thought needs to be given to this comment. I have the Final EIR for this project, which is going to be constructed near Upington, where there is guaranteed sunshine for most of the year. The whole idea of the high temperature molten salt is that this should be capable of retaining adequate heat to maintain 100 MW continuous output 24/7 when the sun isn't high enough in the sky to provide effective heat into the molten salt.

There is no indication in this document that there won't be adequate sunshine through any 24 hour period on occasions, preventing the full power output of 100 MW from being achieved. One obviously wouldn't consider installing such a project in a temperate region with, say, only 30% or less guaranteed sunshine throughout the year. Providing batteries to supply an output of 100 MW at whatever voltage is available to be transformed to the grid voltage would be a logistical nightmare on costs alone. I don't recall if the sunshine régime at Upington is mentioned in the final EIR, but it is surely very high.

However, how the facility will perform won't be confirmed until it is up and running, but in my opinion the negative opinion expressed by this comment on batteries should be modified. We are talking about a relatively high output power station, 100 MW, not a low capacity solar heater for household hot water production, which definitely will only provide heat energy when the sun is shining.

Response (9)

The proposed CSP to be constructed at Upington is estimated to have a load factor of 64%,increasing to 70% with 14 hours of electricity storage, compared to Eskom's coal fired power stations which have average load factors of approximately 80-90 percent.

Your comment (10)

15 P253 Section 10.2 PoS, 7th dotted point, quoting: "*DEAandDP various guidelines on specialist studies*". I have two comments to make.

First, although it is quite irrelevant to this EIA process, please note that the DEADP is the WC's Provincial Administration's ***Department of the Environment And Development Planning - DEADP***. To add "*and*" is, therefore, superfluous.

Response (10)

While it is acknowledged that you are not incorrect, DEA&DP is also not incorrect. This form of the acronym is used by the Department itself.

Your comment (11)

Second, for various reasons which I am not going to specify here, I would suggest that it might be wise to check with the WCPA's newly appointed MEC for their DEADP that he doesn't see any need to make any interim changes to their EIA guidelines before the 2009 general elections, even though the national government's DEAT is the primary authorizing department for issuing the RoD. I suggest this measure merely as a precaution, even though there may be some let-out clause in their EIA guidelines for EIA processes which are already under way.

Response (11)

Your input is noted and greatly appreciated. Arcus GIBB keeps abreast of all national and provincial legislation and policy changes.

Your comment (12)

16 **P.263 Section 10.6.4 Specialist Investigations:** In view of complaints which have recently been expressed about the Thyspunt and Bantamsklip sites by environmental and recreation groups, I suggest that the Tourism section be expanded to include recreation.

Because tourism and recreation are not necessarily synonymous, therefore the title needs to be expanded to ***Tourism and Recreation***.

Response (12)

Comment noted. This will be referred to the tourism specialist.

Your comment (13)

17 **P.267 Sub-section (h) Freshwater supply:** I propose that the word "***hydrocensus***" be included in the definitions table

Response (13)

Your comment is noted and a definition will be included in the EIR and/ or relevant specialist study.

Your comment (14)

18 **P.268 Sub-section (j) Oceanography, clause about the possible rise of sea water temperature:** the potential for global warming and a gradual rise in sea level as the sea-water expands cannot be dismissed, even though lots of people consider that the jury is still out deciding this issue. However, it should not be ignored, whether or not the specialist might feel bound to raise concerns about it.

I note on the next page the following new clause**:** "*Establish* [the] *predictable consequence of sea-temperature rises on all forms of marine life, with specific reference to the impact on squid* - - -" etc. It is axiomatic that, if the sea temperature is going to rise, then because seawater expands above 4 deg.C, the sea level is going to rise as well. The very fact that the possibility of a rise in sea temperature is required to be considered at all, albeit from its effect of sea fauna, indicates that global warming is accepted as being a distinct possibility, and certainly, at the very least, a phenomenon which is not to be ignored. This reinforces my point about including a discussion on global warming in this sub-section - see previous paragraph. The specialist needs to be informed of this additional information for his assessment report.

Response (14)

*Global warming is accepted and has been identified as a potential threat under section **7.2.4 Oceans**. A 1: 100 year sea floodline study has also been commissioned. The results of this study will be presented in the Draft EIR. All the EIA specialists will be assessing the potential impacts of climate change in their reports for the Draft EIR.*

Your comment (15)

19 Pp.269 - 270 AQ Impact Assessment - last two dotted clauses on p.269 and the first one on p.270: The possible release of radionuclides in particulate form, together with gaseous radioiodines (radioxenons can effectively be eliminated because they are metabolically inactive), although their distribution in the atmosphere can obviously be predicted by a specialist in airborne dynamics, their health effects by reason of their radioactivity must be dealt with by a radiological specialist.

This most important splitting of specialist professions for this AQ assessment, although not mentioned in this sub-section, should incorporate the intervention of a radiological specialist as required in sub-section ***(o) Human Health***, which relates to the health effects from ionizing radiations. The health effects assessment needs to include ionizing radiations arising from radionuclides released into the atmosphere. Refer also to Clause 21 below.

Response (15)

Although the various human health issues will be discussed, the extent of which are described in the Plan of Study for EIA, in the EIR it should be noted that issues pertaining to nuclear safety, radiology and radiation fall within the ambit of the National Nuclear Regulator, Act, 1999 (Act No. 47 of 1999) (NNRA) and will therefore be assessed and considered by the National Nuclear Regulator (NNR). However, according to a notification of statement issued by the Department of Environmental Affairs regarding the "consideration of matters pertaining to nuclear safety in environmental impact assessment processes on nuclear installations", dated 10 February 2009, "one of the most significant changes made to the South African legislation by the NNRA was the introduction of the provision of public representation and public hearings in the licensing process for nuclear installations. In terms of Section 21 (4) and (5) quoted below, the NNR licensing process is open to public participation and this is considered administratively just.

S21(4)(a) "Any person who may be directly affected by the granting of a nuclear installation to an application in terms of subsection 20(1) of the NNRA may make representations to the board, relating to health, safety and environmental issues connected with the application, within 30 days of the date of publication in the Gazette contemplated in subsection 3(b) of the NNRA.

(b) if the board is of the opinion that further public debate is necessary, it may arrange for such hearings on health, safety and environmental issues as it determines.

S21(5) Subject to the board's approval, the chief executive officer may

- *(a) refuse an application for a nuclear installation or vessel license and must provide the applicant in writing with the reasons for the refusal; or*
- *(b) grant an application for a nuclear installation license subject to such conditions as may be determined in terms of Section 23 of the NNRA.*

Your comment (16)

20 P.271 Section (n) Social Impact Assessment 4th dotted clause, quoting: "*Health and social well-being of people in 80 km annulus*". If this distance really does refer to an ***annulus***, does the 80 km refer to its ***diameter*** or ***radius***? Also, again if it is really intended to mean ***annulus***, then a ***minimum diameter*** (or ***radius***?) obviously needs to be specified. (If ***I*** don't ask the questions then a highly qualified

professional specialist assuredly ***will*** do so. It's better to be prepared in advance with unambiguous information).

Response (16)

The 80 km annulus refers to the radius. The meaning of the question regarding the minimum annulus is unclear. An 80 km radius for the study has been stipulated.

Your comment (17)

21 P.272 Sub-section (o) Human Health: with the requirement for air dispersion and deposition modelling, presumably similar mathematical prediction modelling techniques as for the AQ work will be used. But if two different modelling techniques are used, the question which is bound to be asked is which is the better of the two? If there's an unchallengeable answer to that question, why use two modelling techniques rather than one, the best, if the best can be identified?

It would seem that, iro atmospheric dispersion modelling, the two specialists, i.e. one for AQ and the other for Human Health, need to work very closely together for certain overlapping aspects in order that the same work isn't repeated, which would unnecessarily increase costs. And if two specialists were to come to *different* conclusions through the use of different mathematical dispersion modelling techniques, the question then would be which one's work is going to be taken the more seriously, if either? The trap of the possibility of conflicting data must be avoided, otherwise the nuclear opponents will neatly squeeze themselves through the gap and attempt to trash all the data.

I apologise for not having identified this point in the DSR.

Response (17)

All air dispersion modelling is performed by the Air Quality specialist (Airshed Planning Professionals) and the results are used by the Health Risk Assessment specialist (Infotox) for radiological dose quantification.

An internationally recognised air dispersion model that accommodates complexities such as the influence of topography to predict radioactive and non-radioactive emissions is used. This model was selected to cover emissions related to normal operation, anticipated operational occurrences and design basis accidents. The assessment of beyond design basis accidents is not part of this study but will be addressed in the emergency response chapter of the SSR.

The Air Quality specialist calculates the radiological doses related to the air pathway (i.e. inhalation dose, ground-shine and cloud-shine) and the Health Risk Assessment specialist incorporates this information to account for total radiological dose, including the food chain pathways and liquid effluent related exposures. All relevant exposure pathways will be addressed in the SSR chapter on the potential radiological impact on the public and the environment (PRIPE).

Your Comment (18)

22 P.276 1st point in the Air sub-section: Here we have this mysterious inadequately defined 80 km ***annulus*** mentioned again. It obviously needs to be clarified.

Response (18)

Refer to Response 16 above.

Your Comment (19)

23 P.278 Table 33 Specialist reviewers: not all the items in this list reflect the titles of the various sections given in the preceding text pages. It's as though someone else compiled the table who didn't agree with the subject headings in the preceding text! So where one would expect to find ***Human Health*** – which, in the context of this document, concentrates on the radiobiological effects of radionuclide intakes - we find ***Toxicology***. The ***Human Health*** section seemingly deals with the long term effects of exposure to ionizing radiations from low concentrations of radionuclides which may possibly have leaked

into the atmosphere – incident releases excepted. Thus concentrations of these radionuclides is far lower than would give any short term toxicological effects in individuals.

It need to be understood that radiotoxicity is not the same as toxicology as is normally associated with the more massive intakes of poisonous compounds. The intake of many radionuclides which would act as a chemical poison would be massive, although it obviously depends on the radionuclide. For example, one could ingest a considerable quantity - ten grams, say - of a uranium compound, which would far more quickly cause disruptive human organ problems over a short period through the sheer chemical poisoning effect from the uranium, rather than any short term problems through irradiation from the minimal ionizing radiations emitted over the same period. The latter problems would only arise in the long term, and an individual so exposed would be likely to have excreted most of the uranium long before any possible radiological problems became apparent. This difference arises because uranium has an extremely long half life and, therefore, a relatively low intensity radiation output per unit time.

None-the-less, exactly the opposite can be true, of course, such as in the case of the poi-soning of a one time Russian spy in London a few years ago with just a few *microgrammes* of the very short 138 day half life polonium 210, this time it being the radiation damage - not damage due in any way to chemical toxicity effects – which resulted in the man's death within a few weeks.

The title of this section, if it is intended to confine it to the exposure of individuals to the ionizing radiations from leaked radioactivity from the reactor core, would more appropriately be ***Human health and radiotoxicity***. About the only chemical used in any quantity in PWRs is borax, and this is, or was, used as a laxative medication at one time.

I will also raise again at this point my concern that the ***Tourism*** section should be retitled ***Tourism and recreation***.

Response (19)

Please note that the Page number is "10-26" and not "278". Thank you for pointing this out, this will be corrected in the Draft EIR i.e. "Toxicology" will be change to "Human Health Risk".

Thank you for your suggestions, but Arcus GIBB will not be renaming the specialist studies.

Your comment (20)

24 P.282: I note the comment that the Brazil and Bantamsklip sites are considered not to be suitable for this Nuclear-1 project because of the low power requirements of the Northern Cape Province, and the long transmission lines which would be required to transmit the electricity to the south coastal region, and Mpumulanga.

Although I accept this point for Nuclear-1 project, I believe that there could be considerable opposition to using either the Bantamsklip or Thyspunt sites, merely from reading about various objections which have been raised by environmental groups and reported in the *Cape Argus*. The point is made in this document that getting all the preliminary works concluded, e.g. EIA processes, servitudes and land bought, then the construction of the pylons and installing the overhead power lines, etc, cannot be carried out within the timescale that the Nuclear-1 reactors will require to be commissioned, taking into account the need for Eskom to increase its generating capacity in the shortest feasible time.

However, the further nuclear EIA processes, i.e. Nuclear-2 to 4 and possibly even 5, are going to require the use of these sites up the West Coast, including Duynefontein, so presumably Eskom will be putting the EIA processes in hand for the additional transmission line network so that it will be available for use

by the time the additional PWRs are ready to start generating electricity. Two new ~1500 km transmission corridors is a large project, of course.

If this work isn't seen to be started soon, my guess is that public opinion is likely to take the view that Eskom isn't enthusiastic about using the Bantamsklip and Brazil sites at all. Not only that point could be raised, but the rather unfortunate situation could be reached that the lines will never be ready in time for* any *of the succeeding nuclear EIA processes. On another planet this possibility might be regarded as – perverseness?

Response (20)

Thank you for your comments. We assume that you are referring to the two Northern Cape Sites Schulpfontein and Brazil and not to Bantamsklip. The Nuclear Energy Policy (section 15.8) recognises the need to identify potential nuclear sites to ensure a strategic reserve of nuclear sites. Government and Eskom are in discussions to implement the requirements of the Nuclear Energy Policy and ensure sufficient generating capacity to meet the growing demand. As soon as this process has progressed sufficiently Eskom is likely to initiate EIAs for the transmission lines associated with Brazil and Schulpfontein.

APPENDICES

APPENDICES A, B, C, D & G - no comments

APPENDIX E - Specialist studies

Appendices E3, E4, E5, E6, E7, E8, E10, E12, E15, E17, E18, E19, E20, E21, E23, E24 - no comments

Your comment (21)

APPENDIX E1 - Climatology: in the first paragraph I'm not certain what NNR stands for - *new nuclear reactors*? This anagram is an unfortunate choice, because it conflicts with NNR used for the ***National Nuclear Regulator***. The abbreviation needs to be changed for this climatology reporting order to eliminate any confusion

Response (21)

Your comment is noted.

Your comment (22)

APPENDIX E2 Geology and Seismics: there are seismic implications which will need in-depth interrogation, especially the effect of a seabed earthquake event, which can produce a substantial tsunami. This appendix merely gives a review of what's involved in the seismology aspects of the five sites in brief tabular format, which is arguably too superficial. It needs to be properly spelt out, which presumably we won't now see until the Draft EIR becomes available. ***Refer also to my comments to Appendix E11 below.***

Response (22)

Your assumption is correct. The principal function of the Scoping Report is to identify and describe potential environmental impacts primarily through desktop studies. Although the identified issues will be discussed in the EIR, this information forms an integral part of the Site Safety Reports which form part of the NNR nuclear licensing process.

Your comment (23)

APPENDIX E9 Fresh Water Supply, Section 4.2.4 Desalination: in relation to process and potable water, consideration should be given to the possibility of fresh water supplies being independently obtained from desalination plants for the Duynefontein and south coast sites, be-cause of the relative scarcity of fresh water, particularly for potable purposes

Response (23)

Desalination is being considered as a method of freshwater supply for all of the sites and is included in the scope of the EIA.

Your comment (24)

Section 4.4.1 Local Authority supply (of fresh water): of the water pumped from the Orange River for the Brazil site, what amount would be returned to the Orange River, assuming a once-through flow system? Would any water reservoir be provided at the site in order to reduce the requirements from the Orange River? What is the situation with water supplies from upstream to this river during the dry season? Will extracting water from the river have a deleterious affect on its ecology? What could the effect be on the river's ecology by pumping back warmer water into it? Will a differentiation need to be made between the permissible impurity contents of process and potable water?

With variations on the theme, the same questions which I have asked above could arise - and there could indeed be a lot more questions, too - with the other four sites, therefore I won't repeat them for all five sites

Response (24)

Should the Brazil site have been taken forward into the Impact Assessment phase of the EIA, such issues would have been investigated. However despite such it is important to note that the bulk of the water used at the NPS (cooling water) will be taken from the adjacent ocean for cooling processes. A much smaller amount of water will be taken from rivers to be used as potable water.

Your comment (25)

Section 4.4.4 Desalination: it is suggested that this process could provide adequate "*water supply to the site*". Would this require further processing in order to provide water suitable both for process *and* potable purposes? Fresh water supplies which are provided independently of external sources - the latter being both scarce and be required for potable purposes - would seem to provide a distinct advantage. In any case, why lose so much heat which is totally lost on its return to the Orange River rather than use it for desalination purposes? Apart from the initial outlay on desalination plants and delivery pipework, the heat is for free!

Response (25)

As indicted, it is considered that all sites would require a desalination plant to produce potable water should a NPS be constructed at that site. Cooling water will be obtained from the ocean.

Your comment (26)

Section 6.2 Site sensitivity, quoting the last sentence: "*Desalination is a potential cost effective option at all sites*". But haven't I read somewhere else in these documents that desalination is considered to be an expensive option, and therefore it isn't necessarily viable? This dichotomy of viewpoints needs to be distilled into a common denominator!

Response (26)

Potable water for all sites will in all likelihood be supplied by means of a desalination plant.

Your comment (27)

Section 7 Conclusions: I entirely agree! In a land with sparse water supplies, does the use of sparse natural water supplies not become a social issue? (I will hopefully find out what the view-point about this is when I reach the *Social Issues* Appendix)

Response (27)

Your comment is noted.

Your comment (28)

APPENDIX E11 Oceanography, p.2 last para, quoting: "*There is anecdotal evidence that the Struis Bay harbour "emptied" during the* [2004 Indian Ocean] *tsunami*." Well, that's news to me, but if it really did empty, is there also anecdotal evidence about the huge(?) wave and continual high seas behind it which came back to refill the harbour?

There is any amount of evidence to demonstrate that when the sea recedes from beaches as a result of a seabed tsunami, there's no time to stare in wonderment**:** get the hell out of it to high ground pdq! Did people who observed the harbour "emptying" actually do this? What was the return wave like? How much damage did it cause, and how many boats were beached on high ground outside the harbour, and how many were smashed against the harbour walls? At what state of the tide did the phenomenon occur? At this tidal state, how deep is the water in the harbour? Whatever it was, in emptying the harbour the actual tsunami pre-return wave trough would have necessarily been ***deeper*** (to an unknown amount?) than the depth of the water in the harbour for it to have allegedly emptied. Have all these factors been positively confirmed by a tsunami specialist? Will all these aspects be dealt in depth in Appendix E2 in the draft EIR?

To include such an anecdotal story in this document, there must be irrefutable substantiation of the phenomenon. The simple statement provided is not acceptable. If it really occurred, then I find it strange that the *Cape Argus* and/ or *Sunday Times* failed to report the spectacular event in Struis Bay harbour. I don't wish to appear cynical, but positive irrefutable evidence needs to be provided that the phenomenon spread so far as to be a noticeable event in the Struis Bay harbour, rather than the odd slightly higher than normal waves, as did indeed occur along the northern east coast of Africa. This needs to be dealt with in detail in Appendix E2 Geology and Seismics

For information, it has to be understood that there's a multi-trillion tonne unstable escarpment on one of the Canary Islands waiting, one day, to slip off and down on to the sea bed, creating a large (huge, who knows?) tsunami which will travel across and around the Atlantic Ocean. That really will be a frightening experience, certainly along the western seaboard of Africa and South Africa.

I am anticipating an authoritative discussion of these potential seismic events will be presented in Appendix E2, or whatever it will be designated, in the draft EIR. Other than the briefest mention, seismicity *per se* hasn't been dealt in this appendix.

Response (28)

This excerpt is from the last paragraph on Page 1. Your comment will be referred to the relevant specialists – namely Oceanography and Sesimology.

Your comment (29)

APPENDIX E13 Air Quality, P.18 Section 45.1 Current Air Quality Levels 2nd para: this mentions sulphur dioxide (SO2) as an airborne pollutant at Duynefontein, one of the sources being the Chevron refinery in Milnerton. When I worked at Koeberg up to 1992, when it was the Caltex refinery, it emitted at least ten times the emission of SO**2** than now, ie at least +80 tonnes per day. I never recall any occasion when it was apparent that SO**2** had spread from the refinery to Koeberg, 25 km away. The Chevron refinery has had its fair, and occasionally unfair, amount of criticism levelled at it iro airborne pollution, in particular from its neighbouring communities in Bothasig and Table View.

I have been involved for nearly 15 years with an NGO (Northern Communities Air Monitoring Task Group) which has been maintaining an oversight of the monitored levels of airborne SO**2** from the refinery, the data being collected in the surrounding local communities, and being analysed, by the City of Cape Town's Scientific Services. The CoCT's Scientific Services are, as far as I am aware, not responsible for data collection as far away from the refinery as Koeberg.

Although I cannot doubt that the low concentrations of SO**2** could indeed have been detected in air samples taken at the Koeberg power station, although I wasn't aware of these data, the question is who carried out the sample collection, analysis and reporting, and how was its source identified? But never through all those 15 years of my involvement with the NGO have any results for SO**2** air pollution at Koeberg ever been reported back to the NCAMTG from any information source. If there are other nearer sources of this pollutant, apart from that from motor vehicle exhausts, of course, what positive evidence is there that the Chevron refinery is responsible for any substantial fraction of it? On how many occasions over the past 15 years has the wind direction been clearly in a straight line right from the refinery to Koeberg, plus and minus 12 to 15 degrees, say, allowing for spread of the plume over the 25 km distance?

The only time that I am aware that a noticeable amount of SO**2** might possibly have reached Koeberg would have been from the sulphur fire at the AECL sulphur dump at Somerset West, which was set alight by a veld fire around 1998. The smell from it was quite noticeable in Milnerton.

Response (29)

Since no measurements of atmospheric sulphur dioxide have been made at the Koeberg power station, it was not possible to provide actual levels in the report.

The chapter on background air pollution merely stated the potential sources of criteria pollutants, such as sulphur dioxide and oxides of nitrogen. No attempt was made to apportion sources of these pollutants. The refinery is, however, still considered to be a significant single source of sulphur dioxide emissions in the study area, in spite of the significant reductions.

Background measurements of sulphur dioxide and oxides of nitrogen will take place to establish actual air concentration levels for inclusion in the EIA.

Your comment (30)

P.20 Top line, quoting: "*In contrast to sulphur dioxide, there is a clear upwards trend in ambient **PM10** particulate air**borne** concentrations (Figure 5)".* A suggested rewording is indicated in **blue**.

Response (30)

*Your comment is noted. The specialist is referring to the concentration of PM10 in "air" and thus the specialist will reword as follows: "In contrast to sulphur dioxide, there is a clear upwards trend in ambient **PM10** particulate air concentrations".*

Your comment (31)

P20 Paragraph under Fig.6, quoting: "*An interesting downwards trend is observed in the nitrogen dioxide concentrations from 2000 to 2007, as shown in Fig.6. This is especially interesting since motor vehicle exhausts contribute a significant portion of this pollutant*". The reason is most likely to be attributed to there being fewer older motor vehicles on the roads using lead substitute fuels, and more vehicles using unleaded petrol with catalytic afterburners. Therefore the reduction in nitrogen oxides is a natural result, the "*especially interesting*" feature being the benefits which have accrued from the use of unleaded fuel and catalytic afterburners.

Response (31)

You comment is noted.

Your comment (32)

P21 Section 4.2 Atmospheric corrosion, 2nd para, quoting: "*The coastal regions extending some 4-5 km inland tend to be most corrosive due to the effect of wind swept chlorides. High humidity along the west coast further exacerbate the detrimental effects of such chlorides, and hence the 'extreme severity' classification given in*" [Figure 7].

I don't understand the reference to "*high humidity*" along this part of the western coastal region - see Fig.7. The cold Benguela current - around 12 deg.C? - travels up for a considerable distance before veering off to the west into the open Atlantic Ocean. The whole of this coastal region is noted for its desolate and barren sand dunes, with little vegetation. That doesn't indicate a high humidity.

The reality is that the strong westerlies carry minute seawater droplets inland. I don't know how far they will travel inland before the water evaporates, the droplets then evaporating and leaving minute dry particulates consisting mainly of sodium chloride. However, in their initial state of wet droplets from seaspray they will most definitely be highly corrosive. But I cannot re-concile a high humidity with those barren and desolate coastal and inland sand dunes, certainly as the corrosion band gets closer to the equator.

The only aspect which can be reconciled is that, although the humidity of the air blowing on to the coast at sea level is likely to be close to 100% humidity at the relatively low sea temperature of, say, 12 deg.C, the temperature on the land can be anything up to 40 degrees hotter – de-pending on the latitude, of course - and air at 100% humidity at 12 deg.C will be rapidly reduced to a much lower humidity as its temperature rapidly rises to the ambient on the land, merely because its water content remains unchanged.

Response (32)

Your comment is noted and in line with the first sentence. The "high humidity" refers to the occurrence of fog along the west coast, which further exacerbates the corrosion.

You comment (33)

P.29 Section 4.3.3 Duynefontein site, quoting: "*Strong southerly airflows are associated with the characteristically warm to hot and dry summer months*". However, if we now look at Fig.20 which shows the wind roses for Milnerton and Koeberg, although the predominant wind at Milnerton is indeed southerly, at Koeberg it has changed direction from southerly to a somewhat greater incidence from the SSW. This

difference can be highly significant when claiming that the Chevron refinery is a source of SO**2** reaching Duynefontein because the wind direction between Milnerton and Duynefontein could have changed to seawards off the direct line of sight between them.

The unanswered question is**:** where, between Milnerton and Duynefontein, does the wind start to change direction to the SSW? It has relevance on whether or not SO**2** airborne pollution can reach Duynefontein from the Chevron refinery, and if so, how frequently?

Response (33)

The prevailing wind direction is an indication of the most likely wind direction; it does not exclude periods when the wind blows in other directions, and therefore possibly also when inline with the refinery. The refinery plumes can theoretically reach the power station, albeit less frequently. However, the chapter on background air pollution does not specifically claim that Chevron refinery has a significant impact on the air quality at the refinery. It merely stated that it is a significant source of sulphur dioxide emissions in the study area.

Dispersion simulations for the EIA will be based on meteorological measurements made on the Duynefontein site for a minimum of five years.

Your comment (34)

P.37 Fig.31: this map shows a predominance in the dispersion of airborne pollution in a northerly direction. If we now go back to Fig.20 on p.30, although there is a definite wind com-ponent from the south, there's a more frequent and somewhat stronger component from the SSW. Some further explanation needs to be provided to reconcile these differences. In other words, why has the southerly wind dispersion component been allowed to predominate in Fig.31 over that from the SSW? Or, at the very least, why not give both dispersion predictions? If it is considered that the difference between a S and SSW wind isn't significant, a quick look at Fig.20 with the coastal edge suggests otherwise, with a SSW wind blowing effectively along the coastal region.

It can make a considerable difference whether airborne pollution following an incident involving the release of radioactivity at Koeberg either goes inland or runs parallel to the coast and then out to sea. Another point about the wind direction is that far more radioactive pollution would stand to be deposited on the sea rather on land.

Obviously the relevance would be entirely dependent on the actual wind direction at the time of a radioactivity release incident at Koeberg. And in mentioning that point, let me very strongly emphasise that I am not suggesting in any way that the probability of an incident at Koeberg has suddenly increased dramatically because of what I find to be irreconcilable differences between the data given in Figs.20 and 31. That would be nothing further from the truth.

The above comments are not intended to relate to the construction phase for Nuclear-1 because, although it will last for a number of years, that phase is obviously transient.

Response (34)

All simulations for the EIA will be based on actual meteorological measurements at the Duynefontein site. The predictions reflect the combined results from each simulation period, i.e. hourly average. Furthermore, the dispersion calculations account for the combined influence of topography, wind speed, wind direction, atmospheric stability intensity and ambient air temperatures. Calm, night-time winds, which typically occur as easterly winds, generally result in high air concentrations as observed over the sea in the simulations

Your comment (35)

P.45 Sub-section 5.2.1 Conventional air pollutants, 3rd line, quoting: "*One tonne of uranium produces the equivalent amount of 20 000 tonnes of coal*". This sentence needs to be reworded as follows**:** "**One tonne of uranium enriched to X% with the U-235 radioisotope produces the energy equivalent to burning 200 000 tonnes of reasonable quality coal**". The **X%** enrichment needs to be given, say 5 to 7%. I note that information on the quality of the coal is given in the continuation of this paragraph on the next page.

Note: because of the input in this particular appendix, I have expanded this next item into a discussion of the logistics for emergency planning at the four future nuclear sites *other than Duynefontein*. It should be noted that I have dealt with my comments here at some length *in advance* of reading through the Emergency Response, Appendix E24.

Response (35)

This equivalency was based on uranium oxide, i.e. un-enriched uranium. Depending on the percentage enrichment, typically 200 tons uranium oxide would be enriched to yield the about 25 to 30 tonnes of actual fuel (U235). For enriched U235, the coal equivalent is about 120 000 to 160 000 tonnes of coal.

Your comment (36)

P.49 Penultimate paragraph, quoting: "*Due to the importance of establishing the correct impact zone at the potential sites, it is strongly recommended that a weather station is installed at the most likely sites as soon as possible*". I couldn't agree more with this recommendation, but I am assuming that by "*impact*" zone this is meant to relate to the nuclear emergency plan once the power station has become operational, for which purpose the wind direction will have a very strong bearing on evacuation procedures and logistics in the event of an incident in which radioparticulates and radioiodines are released into the atmosphere.

Also, preparing the emergency plan for whatever site is selected for Nuclear-1, ***if it isn't Duynefontein***, will need to be started very early during the construction phase. The NNR will not permit a nuclear power station to operate without its emergency plan being approved, fully operational - and tested! The respective city municipalities will find themselves becoming involved with nuclear emergency plan work for the first time, and they will need time to establish their nuclear emergency infrastructure - site, facilities and staffing.

However, if Duynefontein was to be selected, my guess is that there won't be anything like the same problems and learning curve hassle involved as for the other four sites, because of the years of experience the City of Cape Town already has with the existing Koeberg nuclear emergency plan. ***Together with the absence of any transmission infrastructure from the Brazil and Skulpfontein sites, the total lack of experience in nuclear emergency planning could be a deciding feature against the four sites other than Duynefontein in view of the urgency of increasing South Africa's electrical generating capacity.***

Again, if Duynefontein was to be selected, this would offer the perfect opportunity for staff from the other municipalities, who would be nominated to be involved in their future emergency planning procedures, to become involved with the preparation of that for the Duynefontein nuclear project.
I can't see it being practicable for CoCT emergency planning staff to give courses at other municipalities which would eventually have to deal with nuclear emergency planning because it would deplete the CoCT of its own essential emergency planning staff. The CoCT could possibly establish training courses, of course, but to become involved in the actual development work for a real nuclear emergency plan, and testing it, has obvious advantages.

Would such training advantages be lost even if the exact details for the other sites might need some changes? I can only guess at what sort of changes might arise as variations from the Koeberg nuclear emergency plan. For example, would it be practicable to reduce the diameter of the emergency planning

zones for 3rd Generation PWRs? This is a matter for which the reponsibility rests with the NNR to decide, of course.

Response (36)

Comments noted. It should be noted that although the emergency planning will be discussed as part of the EIR iissues pertaining to nuclear safety, radiology and radiation fall within the ambit of the National Nuclear Regulator, Act, 1999 (Act No. 47 of 1999) (NNRA) and will therefore be assessed and considered by the National Nuclear Regulator (NNR).

Your comment (37)

P53 Table A Minimum requirements for the establishment of a surface layer meteoro-logical station: I note that there is no provision for the measurements of PM10 particulates, or even the more physiologically hazardous PM2.5 particulates. These might possibly arise in an emergency release situation. Will they be given any consideration?

Once a week data collection intervals would seem to be rather excessive for data which will be individually collected at intervals from 10 to 60 minutes, whatever the equipment is set at, data which presumably will be stored in incremental form for each successive collecting period, not accumulative over whatever period is decided for the more infrequent intervals for down-loading the data. The latter could lose a lot of possible valuable interim variation data.

Response (37)
During the period prior to a manned weather station (i.e. operational phase), meteorological data will be collected via telecommunication on a maximum two-weekly period to minimise loss of information in case of instrument malfunction. Such data will be accumulated over the entire monitoring life. A year prior to construction, a more comprehensive weather office must be erected, which also includes a tall mast, such as the one currently operating at Koeberg. This office would then include online communication and storage backups in order for the operators to ensure near 100% data collection. This will also ensure data availability for emergency release situations.

PM10/PM2.5 monitoring is not currently envisaged for ambient air. Under normal conditions these are not an issue with the operation of the plant. It may, however, be more applicable to measure during the construction period. Emissions during emergency situations would more appropriately be monitored at source.

Your comment (38)

APPENDIX E14 Economics: In the tables given on p.23 and the following pages, for many of the categories of site characteristics – "*qualitative economic impact analysis*" - the Brazil and Skulpfontein sites come out classified as ***bad***. For a few of the categories they are classified as ***neutral***, and in only one do they come out as ***good***. This doesn't mean, of course, that the three other sites come out as ***good*** in every category**:** they clearly don't. But the overall weighting for the Brazil and Skulpfontein sites is not at all encouraging, according to this FSR.

However, in its wisdom, Eskom has selected five sites, four of which are new to nuclear power, of course. Although I haven't read any specific statements explaining Eskom's choice of Brazil and Skulpfontein (nor, for that matter, for the two sites on the south coast, either), I suspect one reason could have been their relative remoteness, which might, therefore, not attract such opposition from the nuclear opponents as Koeberg has, and as Bantamsklip and Thyspunt undoubtedly will.

But I consider that greater care has to be taken with this report, and that it needs to be very circumspect. The authors haven't given any indication of their awareness of the succeeding nuclear EIA processes, i.e. for Nuclear 2, 3, 4, and possibly 5**:** they have received mention at all. (**Note** added later**:** reading the responses to some of the respondents in the ***Issues and Responses*** appendices who raised the matter that the Brazil and Skulpfontein sites had been worked out of the Nuclear-1 EIA process, the responses indicated that they would be considered for the successive nuclear EIA processes).

An important aspect to remember about this particular EIA process is that Nuclear-1 will only provide between 4 000 and 5 000 MW generating capacity out of the total of about 20 000 MW allocated for the new nuclear power programme.

The matter of site selection is fundamental to South Africa's nuclear power programme. Eskom carried out siting investigations in the 1990s, but they haven't been referred to in this appendix, although they are referred to in Appendix E24 to which, however, the relevant Eskom documents haven't been attached. Therefore it is impossible to formulate any sensible opinions on siting.

Response (38)

The choice of all the sites was based on previous studies conducted in the Nuclear Site Investigations Programme (NSIP) as specified on page v of the Executive Summary of the FSR. The study was undertaken by independent specialists who considered a range of factors in determining suitable sites. Brazil and Skulpfontein do retain the advantage of being remotely located.

Although it has not been mentioned specifically in all specialist studies, specialists are aware that this EIA will not render sites unsuitable for future consideration for the construction of additional NPSs. A site will only be discarded from future consideration should a fatal flaw be discovered.

Please refer to Appendix D of the Final Scoping Report for further information on the NSIP.

Your comment (39)

Perhaps relevant points to raise are**:**

1) Should the four sites, other than Koeberg, not have been made the subject of an independent EIA process purely for the purposes of deciding well in advance the actual order in which nuclear power stations would be constructed on them? It would seem to me that, in choosing the four additional sites in the first place, consideration would, or certainly should, have been given to their suitability for developing nuclear power stations on them. Therefore surely the consideration for this current EIA process should have been not to ***reject any site for its suitability or otherwise for nuclear power development***, but to address a totally different scenario, namely ***the order of priorities for their use when the EIA processes for the Nuclear-2, 3, 4, and possibly 5, projects are to be dealt with***. Otherwise there is the extremely awkward potential situation for Eskom of arguments having been used to reject, say, the Brazil and Skulpfontein sites, which are so overwhelming and forceful that they will end by actually ***excluding these sites from any further consideration as nuclear power stations***. As I understand the situation, the major problem with these two remote sites for this Nuclear-1 project is the present lack of transmission line infrastructure, not any basic environmental consideration for them. Brazil, of course, lies on mining land**;**

Response (39)

It has been made clear that the recommendation to exclude Brazil and Skulpfontein is due mainly to the fact the other three sites have been identified as being far more suitable for Nuclear-1, even at this relatively early stage. At present a large portion of energy is transported from the interior to the coastal regions. The construction of an NPS along the coast would result in these regions being able to supply themselves - with

excess energy being sent to the national grid. This would have been negated should a Northern Cape site be chosen. The other point to remember is that a percentage of electricity is lost when it is transported. Thus the further it is transported; greater is the amount of electricity which is lost. The Brazil and Skulpfontein sites are therefore not unsuitable, but at this point in time are not the most suitable sites, which is what is required by NEMA when attempting to determine the favoured alternative.

In terms of which of the sites are planned for Nuclear-1, -2, or -3; the exact details of any proposed roll out of Eskom's proposed nuclear programme is not yet known as any decision would largely be informed by the findings of this EIA as well the NNR licensing process. It is, however, Eskom's current intention to utilise all three sites for the development of a nuclear power station, should the EIA indicate that all three sites currently being investigated are feasible. The current application is for a 4000MW Nuclear power station on one of the proposed three sites.

Your comment (40)

2) Notwithstanding what I have mentioned in **1** above, is there clear evidence emerging that any of the sites are now considered to be totally unsuited for nuclear power station development? According to the geology data presented in Appendix E3, Geotechnics, this doesn't appear to indicate any problems with rock strata. But if any factors do emerge, then this would provide the strongest argument that the suitability of the four sites should have been dealt with in an entirely separate EIA process, and to assess an order of priority of use**;**

Response (40)

Studies have not shown any of the sites to be unsuitable with respect to geotechnics. Should a fatal flaw, geotechnical or other, be discovered on any of the sites the site(s) will be excluded from further consideration in this or future EIAs.

Your comment (41)

3) Surely it has to be decided, now, whether strong reasons are being invoked why Brazil and Skulpfontein are not only regarded as being unsuitable for the Nuclear-1 project, but whether the reasons are indeed so strong as to ***preclude them from any further consideration*** for the succeeding nuclear EIA processes? In which case the choice of the four sites must be prioritized, and dealt with in sufficient detail to inform Eskom if and why any of them may not be suitable for any nuclear power station development**;**

Response (41)

It has not been recommended that Brazil and Skulpfontein be excluded from future consideration in future EIAs. The recommendation has only been forwarded during this EIA based on the remoteness of the sites from the national grid. The circumstances regarding this factor may change in the future and might make Brazil or Schulpfontein highly favourable sites. These sites have not been identified as unsuitable based on biophysical factors.

Your comment (42)

4) It needs to be clearly and unequivocally established ***in advance*** of the projected Nuclear-2, 3, 4, and possibly 5, projects, so that further deliberations on which site to choose is entirely eliminated from any further consideration. In other words, work entirely on the basis that the sites are now pre-selected in their order of development preference, so that they no longer need to form any part of the successive PWR nuclear EIA processes. I cannot see the justification for having chosen to deal with the matter of sites in such a manner as to make it virtually impossible to include the sites which have been rejected for the Nuclear-1 process from any further consideration for the successive PWR nuclear EIA processes.

Refer to my note in **blue** above.

Response (42)

A combined application is being considered by Eskom and is discussed in the Final Plan of Study for EIA. The approach chosen by Eskom will depend on pending legislation and consideration by the Department of Environmental Affairs. If this process is followed authorisation will be obtained for all three sites.

Your comment (43)

APPENDIX E16 Human Health, Section 5.2.1 Impacts of the environment on the project: a most interesting inclusion in a nuclear power plant project, i.e. poisoning the work force with agricultural insecticides! That's certainly turning the tables on Earthlife Africa! No further comments on this appendix.

Response (43)

Comment noted.

Your comment (44)

APPENDIX E22 Fig.4.1: this is really excellent reproduction because I can magnify it to 125% and get a perfectly clear image. That cannot be said for a lot of the pics.

Response (44)

Every effort is made to provide high quality images in the FSR. The difficulty is that many of the images occupy a lot of memory making them difficult to transfer or place on a website. Compressing the images to reasonable size often compromises the quality.

Your comment (45)

APPENDIX F - Legal requirements: Section 8.7 deals briefly with the Radioactive Waste Management Policy and Strategy, in which the 5th dotted point says "*No import or export of radioactive waste**:** in principle South Africa will neither import nor export radioactive waste*".

Irradiated fuel elements are normally thought of as nuclear radioactive waste - nuclear radwaste - especially by the nuclear opponents. For them it becomes the favoured theme for their opposition to nuclear power in that there are few active projects anywhere in the world for the construction of long term repositories for high active radwaste. However, what will become an important aspect of nuclear power in the future will be the reprocessing of irradiated fuel elements to separate out the residual uranium and the transuranics, for use in fast breeder HTRs.

Therefore, although, ***in principle***, South Africa will neither be exporting nor importing rad-waste, the fact of ***exporting*** nuclear radwaste may become necessary for the transport of the irradiated fuel elements and pebble bed irradiated fuel spheres to reprocessing facilities abroad, if South Africa doesn't construct its own chemical nuclear reprocessing facilities. And if it eventually does do so, then South Africa could decide to ***import*** nuclear radwaste for reprocessing in its own facilities, especially if other African countries without hydropower decide to go the nuclear route.

Thus I wouldn't expect this principle of neither exporting nor importing radwaste, *when applied specifically to **nuclear radwaste***, to be cast in stone, in particular because as these irradiated fuel elements remain a valuable resource for reprocessing into new nuclear fuel.

Response (45)

Thank you for your comment.

Your comment (46)

1.1 APPENDIX - H Transmission impact assessment, P.12 Last para, quoting: "**With no major** *load centre - - - to resolve. Loss of transmission lines - - - can easily result in dynamic* ***stability*** *of the generators*". My highlight. Although I am unfamiliar with the performance of generators and their stability, my guess is that ***stability*** should read ***instability***. Or, with alternate wording, it could be expressed "*can easily affect the dynamic stability of the generators*" instead of "*result in*".

Because of the relative remoteness of the Brazil and Skulpfontein sites from centres of high electricity consumption, Cape Town being the nearest, some brief mention needs to be added to the draft EIR to explain the generator instability problem in the event of the loss of the trans-mission line, and what generator damage it could cause. I assume that the problem arises at the transmission breakpoint, ie how to dump the electricity that the generator can't export during the transient shut down phase. Although the steam supply to the generator turbine can obviously be diverted to seawater heat exchangers in a very short timeframe, a rapid braking of the very heavy turbogenerator set presumably isn't so easy to achieve because of their rotational momentum.

Would it, therefore, not be possible for the seawater desalination plant to be designed to take the generating load from a turbogenerator during its slowdown period?

In fact, the question stands to be asked**:** is Eskom really - *really*? - considering constructing these new nuclear plants and not provide desalination plants at the same time? The potable water supply situation in South Africa is going to get worse as the population continues to rise, and ever more indigent people need to be provided with potable water. Desalination has been mentioned in Section 4.2.4 in Appendix E9 as a possibility, rather than a definite fact - see my comment above - but only for supplies of potable (aka "fresh"?) water for use at the sites. The wider issue of supplies to the potable water distribution utilities will surely need to be considered?

Response (46)

Comments noted. As indicated desalination plants will be included for all sites as part of this EIA.

Your comment (47)

P.13 Penultimate para: this mentions power losses along long lengths of transmission lines. As I understand the position, the new transmission lines are intended to take 765 kV. I therefore suggest that some information should given on the advantages of transmitting at 765 kV line as opposed to the existing 400 kV, in particular what reduction in transmission losses will be achieved. (I see on the next page that transmission alternates are given, either UHV (ac) at 765 kV or HVDC at 600 kV. This is the first time that I have seen these alternates mentioned. I had been under the impression that losses are higher from DC than AC, so the advantage of the HVDC alternate over the UHV needs to be *briefly* explained. The immediate point which comes to mind is that 600 kV is less likely to arc than 750 kV, whether ac or dc.

Response (47)

Comment noted. Your request/ recommendation will be considered.

Your comment (48)

P.15, second para: this is discussing South Africa's proposed bid for the Square Kilometre Array radio telescope and that transmission lines must be adequately distanced from the array so as not to cause any interference. However, it hasn't been mentioned in this report what the minimum acceptable distance is. This information needs to be added.
The point has been reiterated in this appendix about the time and costs involved to have new transmission lines constructed to serve the Brazil and Skulpfontein sites. I have discussed my concerns about the confusing procedure which has been adopted to determine the possible use of these two sites in Appendix E14 above - *qv*. The simple question is: have the EIA processes for the 765 kV lines from Gauteng and Mpumulanga been started yet? If not, when will they be started?

Response (48)

Yes many of the EIAs for these specific proposed transmission lines have already commenced. Eskom is currently undertaken several Transmission line EIA's across South Affrica. You are encouraged to visit www.eskom.co.za\eia for a full list of EIAs currently been undertaken by Eskom

Your comment (49)

ISSUES AND RESPONSES APPENDIX

I wish to draw attention to the fact that, for a number of these responses, the actual original document and the responding text are in separate electronic files. Whoever made the decision to separate these two texts must assuredly have forgotten that they weren't being presented to I&APs in hard copy format, when cross-referencing to both documents is very easy. Maybe it is mistakenly believed that no I&APs will be interested in any comments and responses except their own, but I would hope that this is not the case – certainly where I am concerned. It would be very extravagant both in paper and ink to print out a whole document, but at the same time I am certainly *not* suggesting that hard copies should be provided to I&APs instead of electronic copies - except in libraries, of course - which would be a totally un-necessary expense to the proposer's account.

Perhaps the best example of how to make checking the original points and the responses easy is to do what has been done with the comments on the LRC's submission, where each section of their text is copied first, with the response immediately following. I would guess that different staff dealt with different submissions, and hence the reason for the differences in presentation format. Just a point. (Footnote: reading on later, I see that in a number of cases the comments and their responses have been dealt with in tabular form).

Response (49)

Comment noted. Your feedback is appreciated and consideration will be given to these points.

Your comment (50)

Comments on the Responses to the Legal Resources Centre (LRC) submission on behalf of Earthlife Africa (ELA):

P.2 Introduction - Environmental pollution: it is perhaps curious that ELA (through the LRC) should have referred to increased environmental pollution in the environment around Koeberg. I note the response, of course, but I would also comment that a nuclear power station doesn't produce any significant amount of free radioactive wastes from the nuclear operations, other than irradiated fuel elements, of course. The radioactive wastes effectively remain safely locked in the fuel elements. What hasn't been mentioned by the LRC is what evidence ELA presented to them to justify raising the issue at all. Does ELA have clear evidence that the presence of Koeberg has had a detrimental effect on the environment? And if so, what pollutants are involved and what health hazards have they presented to local populations?

Obviously the footprints of the nuclear plant and ancillary facilities, office block, etc, take up ground area. Also every nuclear power station has to be run using manpower, therefore there's the normal arising of wastes of various sorts associated with staff. Such wastes are handled in a manner which is not detrimental to the environment.

Raising a matter about which I am not at all clear, yet, is whether the LRC are acting truly independently as the attorneys for ELA, or whether the LRC has its own agenda as a nuclear opponent. The latter situation would obviously be incompatible with the LRC representing ELA rather than the former acting perfectly reasonably in its own right as a totally independent I&AP.

If the LRC wish to challenge this statement of mine, they first need to explain the clear ambiguities which they have successfully succeeded in raising in my mind by the very manner, and the detail, in which they have submitted the case allegedly for ELA. If the LRC are unable to see the nature of the ambiguities, that is rather unfortunate, in so far as they are adopting the wrong communicating tactics. What comments they prepare, just as much as mine, are subject to scrutiny by all other I&APs and the specialists. Unless, of course, the LRC wishes to invoke some obscure undemocratic legislation which debars this!

Response (50)

Comments noted.

Your comment (51)

P.4 Section 2.1 Life cycle costs: here we have another curiosity which is typical of the nuclear opponents, either not first asking themselves associated relevant questions, or not being sure what questions to ask. The ELA point as raised by the LRC is, of course, that although during reactor operations very little pollution is emitted into the environment, a lot of airborne pollution, mainly the "carbon footprint", arises from ore mining to metal refining and machining components, etc, and in the production of the rebar and cement for the reinforced concrete, and transport. What is all too easily - and most likely very conveniently - forgotten is that airborne polluting sources of energy still predominate, worldwide.

Although I don't have any figures to hand, there's no possibility of manufacturing and constructing wind generators on towers, for example, with all the attendant manufacturing and construction work just as for nuclear power stations, and not involve energy from polluting sources, e.g. coal, oil and gas. Arguably the worst country for an intolerable level of air-borne pollution is China. Few countries are well provided with hydropower.

Exactly the same situation of pollution arising will apply to solar concentrating installations. Only when such installations, together with nuclear power and renewable energy resources, predominate for central generating purposes will the airborne pollution fall. I haven't mentioned the great favourite with the nuclear opponents, *viz* wind power, but that source isn't suitable for baseload generating purposes. How many locations have a 24/7 history of wind blowing continuously through the required speed range?

Response (51)

Comment noted.

Your comment (52)

P.6 Impacts on land use and spatial planning: here we have another curious ELA myth, that the Koeberg PWRs will be decommissioned in a few decades. Their life has already been increased to 50 years. The US NRC has already extended the nuclear license authorisation for a number of their nuclear reactors to 60

years, including Westinghouse PWRs, the Koeberg PWRs being French modified Westinghouse type. In 2006 a US NRC Regulator commented that he didn't see any reason why these reactors couldn't have a life extension to 80 years, providing they were still operating efficiently, even though they were an older design than what will eventually comprise the new generation of PWRs in the current Eskom programme.

As an example of long life, the UK's first generation gas cooled reactors, especially those at Windscale and Chapel Cross, ran for about two decades beyond their intended life, producing the cheapest electricity, until maintenance and fuel production costs began to make them uneconomical to continue to operate.

Perhaps the only relevant comment wrt spatial planning for the future is the 5 km exclusion zone. The implication that the financial viability of the CoCT will be detrimentally influenced by a relatively small exclusion area around Koeberg would seem to be unreasonable. And if the meteorological forecasters' new frightening scenario of 5 metre waves inundating the coastal regions is anything to go on, don't develope on relatively low lying ground too close to the Atlantic seaboard. Witness the high wave scenario on the west coast on Friday, August 22, 2008. (**Footnote**: the most recent high tide and waves were far more devastating).

Response (52)

Comment noted.

Your comment (53)

P.9 Economic impacts - Economic needs of disadvantaged communities, etc: the response refers to the Brazil and Schulpfontein (i.e. Northern Cape) sites as being "*clear that the Northern Cape sites rank as the least favourable sites for the proposed development, **and are sought to be scoped out of the EIA process***." [My highlight].

There are to be successive nuclear EIA processes, as I have mentioned more than once above, viz Nuclear-2, 3, 4, and possibly 5, before the full generating capacity of the projected 20 000 MW nuclear out of a total projected 40 000 MW is achieved by 2024 or thereabouts. Are we now definitely saying that the intention is to try and eliminate any further consideration of the Brazil and Skulpfontein sites not only for the Nuclear-1 process, but from the succeeding processes?

Someone has to make a clearcut decision**:** for the succeeding nuclear processes, is it intended, or not intended, to include the Brazil and Skulpfontein sites, or is it the intention to eliminate them from further consideration as nuclear sites? As I have already mentioned, it would not be sensible to eliminate the Brazil and Skulpfontein sites from the Nuclear-1 EIA process using very strong arguments, and then reintroduce them using new guises and excuses as being suitable for two of the succeeding Nuclear-2, 3, 4, and possibly 5, EIA processes. So the question is**:** what is the clear intention - to consider these two sites, or to totally eliminate them from any future consideration?

These two sites must not be scoped out of this current EIA process for the wrong reasons, because otherwise they won't be suitable for any of the succeeding PWR EIA process. Either a list of construction priorities needs to be prepared, or the two sites have to be eliminated for clearly defined reasons from any further PWR nuclear EIA processes. See my discussion above on Appendix 14 Economics.

Response (53)

As mentioned previously Brazil and Skulpfontein are not being recommended for exclusion from further consideration due to any flaw at the sites. The other three sites are deemed to be more suitable with regard to location from the national grid. The situation may change in the future. All sites which are not chosen

during this EIA will still be suitable for consideration as possible alternatives in future applications for the construction of NPSs.

Your comment (54)

P.10 Failure to place relevant considerations before the decision maker and to follow current policy: strangely, with all the information which has been provided in the public domain about the electricity expansion programme, i.e. 20 000 MW nuclear and 20 000 MW from alternate energy sources, to be up and running by around 2020, ELA through the LRC seem to wish to profess total ignorance about this. They obviously need to acquaint themselves with the actual proposals.

Extracting the following piece from a 1998 government white paper, which the LRC have quoted in turn, sets an interesting scenario**:** "*Whether new nuclear capacity will be an option in the future will depend on the environmental and economic merits of the various alternative energy sources relative to nuclear and its political and public acceptability*". That was 1998 and, believe it or not, as anyone is free to do, but situations do actually evolve, obviously rather faster than either ELA or the LRC have appreciated. A 50 **:** 50 mix between nuclear and non-nuclear, with a minimal addition of coal fired power stations, is a perfectly reasonable way to go, in particular because South Africa has quite substantial reserves of uranium.

The LRC may be well tuned to using the well established legal concept of invoking the decisions of past legal judgements as precedents for the judgements of succeeding cases. However, power supplies don't fall into quite the same category, and the decision-making process continuously evolves as economic development demands additional power supplies.

A particularly interesting development going ahead near Upington is a solar concentrating power station, which is designed to produce a *continuous* electrical output of 100 MW. If the demonstration plant proves to be successful, this should eventually be a very useful complementary base load generating system to nuclear, especially in the remoter locations where the sun shines most of the day, every day, not obscured by clouds.

It is quite obvious, of course, that the argument about alternate energy sources given in the above quotation is really intended to provide Eskom with a supposedly embarrassing situation to try and justify. However, to take an example**:** suppose South Africa wants more hydropower, then it will have to come from our neighbours, our own limited hydropower resources being just about maximally exploited. We should be very thankful to those people who are very happy to wish to prejudice the power requirements of our neighbours for our own advantage and benefit! However, our neighbours may actually require that power for their own development projects. Is it in South Africa's interests to constrain the commercial development of our neighbours by grabing their generating capacity for our own use? The answer is no!

Response (54)

Comment noted.

Your comment (55)

P.14 Waste *[sic!]*: this is obviously intended to refer to radioactive wastes in the form of irradiated fuel elements. All round the world in commercial reactors, the spent fuel elements remain stored in the fuel stores at the power stations, perfectly safely. I have never read of any incidents where the radioactive cooling water has leaked from these stores, which is very unlikely because they are lined with welded stainless steel plates. I stand to be corrected.

For about the first 10 years of their life in store, these plant storage facilities are by far the best place for these spent fuel elements to be stored, for two reasons**:**

first, there are none of the problems associated with the transport of irradiated fuel elements with extremely high radiation dose rates, with the necessity to use very heavily shielded contain-ers, and with the added problems associated with keeping them cool whilst in transit on the roads or railways**;**
second, the eventual transport to the long term fuel repositories can be carried with consider-ably less radiation shielding, and far less cooling requirements, if any is needed at all in the case of fuel elements which have been in store for 20 years and longer**;**
third, these spent fuel elements are going to need to be reprocessed in the future in order to recover the uranium 238 and transuranium elements, which can be used in fast breeder reac-tors. Transporting them direct to the chemical processing facilities from the power station spent fuel stores is going to be far more convenient, and cheaper, rather than transporting them to distant repositories, and then having to remove them for transporting to wherever the chemical reprocessing will be carried out. Such processing would ultimately leave only the relatively useless and largely decayed radioactive fission product wastes to put into long term repository storage.

Only by a continuous process of repeating the obvious – which I refer to as nuclear attrition – will the nuclear fraternity be able to eventually convince most of the nuclear doubters of the advantages of handling the spent fuel elements in this way. This procedure can also be applied to the spent fuel spheres from pebble bed modular reactors, of course.

As I have mentioned previously, this chemical reprocessing work will be necessary in order to recover the useful nuclear fuel which remains in the spent fuel elements, to be used in high temperature fast breeder reactors.

Response (55)

Comments noted.

Your comment (56)

P.15 Quoting: "*It is irresponsible of the applicant to propose a development which will produce high-level radioactive waste* - - - " etc, etc, plus the remaining rhetoric.

It is rather extraordinary, after the number of years that the two PWRs at Koeberg have been operating, that the complainant hasn't understood the perfectly satisfactory situation under which the spent fuel elements are stored in the well designed facilities which have been provided at Koeberg, until such time that the government has established national long term storage facilities. In the previous section I also set out what is likely to be the scenario as it could develop in the future *apropos* the processing of spent nuclear fuel for its still useful residual nuclear fuel content, and why "permanent" storage would not be the best way to go.

It hasn't been normal practice anywhere in the world for utilities to be expected to establish their long term storage facilities or repositories, this being the responsibility of governments. But the question also has to be asked**:** how long is long? Unless the transuranium products, especially the plutonium 239 (Pu-239) content, can be dealt with alternatively than by long term storage, the storage time will be required to be at least for ten half lives, and possibly longer. The half life of Pu-239 is about 24 000 years, and ten half lives is, therefore, 240 000 years. On what basis does the LRC suggest or imply that anyone can possibly predict, now, that any current utility operating now will still be operating over the next 240 000 years? What will the world's governing system be, then? It is obviously quite unfeasible to be considering that utilities provide funding to maintain these future repositories "for ever". It is a meaningless charade, and it needs to be exposed as such. In any case, for how many decades or centuries are those utilities likely to remain in existence?

However, the one situation which we can predict, now, is that there will necessarily be some form of world government, certainly in 1 000 years hence, and possibly within a much shorter time, but what form it will take we cannot hope to predict. Unless there was to be some major world disaster such as a huge asteroid impact which nearly wipes out the world's population as a result of the ensuing period of darkness due to dust dispersed in the atmosphere, it is unlikely that our knowledge of what goes on around us, now, will be lost to future generations. As time progresses, so will the mechanism evolve on improved management for dealing with the radwastes which we leave in repositories, now, but in ways which it is risky to try and predict.

Insisting that the world has to produce, now, a system of disposing of its high level radwastes which will remain relevant even in 2 000 years time, let alone 24 000 or 240 000 years time, is quite unreasonable. But if we have to live with and learn about these strange idiosyncrasies which seem to exist in some members of our contemporary society, who are apparently able to make forward looking predictions far into the future about how the world's population will be living, and under what system of governance, which even the most insightful minds cannot hope to predict, then let us indeed learn about those idiosyncrasies. However, it is to be hoped that contemporary pragmatism and credibility will prevail in this specific situation.

There's no short term solution to the storage of radwaste of any form in relation to the lifetime of the next few generations of humans, other than ensuring that it is stored safely, and in a manner which necessarily we can only hope that we have got it right for tens to hundreds of thousands of years into the future. And that's why the underground repository is the favoured scheme for long term storage, because geology has been well enough established just how stable the earth's crust can be in many places, despite the dynamics of plate tectonics and volcanism, both phenomena being "fuelled" by the heat from the decay of radioactivity in the earth's crust.

However, I am concerned that common sense might not prevail, and that the favoured rhetoric that utilities are being irresponsible in their approach to dealing with spent fuel elements will continue to be bandied about like chaff in the wind. In general, the nuclear industry accepts the extremely high level of responsibility which is expected of it. It learnt a great deal from the TMI-2 incident and Chernobyl-4 disaster.

From the responses that have been provided to the points raised by ELA though the LRC, one wonders with what level of diligence the latter have applied their minds to an in-depth under-standing of the white papers and legislation.

Response (56)

Comments noted.

Your comment (57)

Comments from myself, Comments 10 and 11: please note that where I refer to ***fast reactor***, this should have been ***fast breeder reactor***.

Response (57)

Noted.

Your comment (58)

Comment 14: in mentioning the staff for this Nuclear-1 project, I should, of course, have mentioned that there's Nuclear-2, 3, 4, and possibly 5, EIA processes to get through. Nuclear-1 is only looking at 4 000 to 5 000 MW(e) generating capacity out of a required 20 000 MW(e) from nuclear.

Response (58)

All planning that has/will occur(ed) has/will take into account that more NPS will be constructed.

Your comment (59)

Comment 41: Again I have referred to ***fast reactor*** when it should have been ***fast breeder reactor***. Please accept my apologies.

The principle of using a fuel "blanket" has been tried in fast reactors, e.g. the long defunct Dounreay fast reactor, but using natural uranium fuel in the "blanket", not thorium. The principle of breeder technology was intended by the Germans to be used with their THTR – **T**horium (fuelled) **H**igh **T**emperature (pebble bed) **R**eactor. Unfortunately, the Germans never got round to testing it for its fuel breeding capabilities using a mix of uranium and thorium fuelled pebbles before the Green Party succeeded in getting reactor prematurely shut down.

Response (59)

Comment noted.

Your comment (60)

Comment 42: In this comment I refer specifically to the Nuclear-1 project which will only be providing sufficient advanced PWRs to generate from 4 000 to 5 000 MW(e) out of a total of 20 000 MW(e). I suppose for ***Nuclear-1*** I should more accurately have written ***20 000 MW(e) of new generation PWRs***

Response (60)

Please note that the environmental application for Nuclear-1 is for the construction and operation of a PWR with a generating capacity of up to 4 000 MW

Your comment (61)

Comment 52: I could see this boundary becoming important from the Daft EIR stage for the succeeding nuclear power EIA processes if it becomes clear that Brazil or Skulpfontein may become the preferred sites *following* this Nuclear-1 Project. In which case the Northern Province would then be expected to have a high level interest. However, please refer to my discourse on these two sites in **Appendix 14 Economics** above.

Response (61)

Your comment is noted.

Your comment (62)

Comment 58: One such person recently got the interpretation of the power output for the PBMR quite wrong, mistakenly equating its 402 MW (total) power output with its MW(e) generating output.

Response (62)

Comment noted.

Your comment (63)

Comment 59: As a matter of interest, I recently asked an Atlantis resident who represents the interests of Atlantis residents on the Koeberg Public Safety Information Forum if he thought that there might be resistance to the Nuclear-1 and/or successive projects, asking the question "*If Koeberg was to be the favoured site would Atlantis residents tend to oppose it if they realised that employment opportunities for them after the construction phase would be minimal*?" His answer was quite positive that they appreciate the need for South Africa's generating capacity to be very substantially increased, and that it's other factors which would be more likely to pro-vide greater employment opportunities for them as a result of more power availability, e.g. the expansion of local industry.

Response (63)

Comment noted. The comment is quite insightful and is often lost on many I&APs. The Atlantis resident is correct; the benefits of power production will have further reaching effects which will influence the very core of the economy. The jobs that will be created during construction and operation are incomparably small compared to those that will be sustained and created in South African industry due to the availability of electricity provided by the NPS.

Your comment (64)

General comment: when the generating units are described in the draft EIR, may I suggest that it's made clear that it's the ***electrical*** generating output which is being given, not the ***total*** power output of the reactor. For example, defining the former in units of MW(e). This would prevent important personalities from making misleading statements in speeches about power output, mistakenly interpreting total power output for the actual generated power output - which has indeed occurred, as I have mentioned above. Getting used to giving the correct power indication has not been a problem with the PWR programme, but it has been with the PBMR programme, largely because the total power output becomes an important consideration both for seawater desalination and future energy-economical hydrogen production. No one ever seems to think in terms of a 1 000 MW(e) PWR having a maximum output of around 4 000 MW(t).

Response (64)

All figures quoted in the Nuclear-1 FSR and consequently in the Draft EIR will be electrical output.

Your comment (65)

Comments from Ms Liz McDaid of Earthlife Africa, first dotted comment on p.1, quoting: "*No site should be de-selected at this stage of the EIA process, i.e. 5 sites must be assessed".*

In my discourse in **Appendix 14 Economics** above I make the point that any deselection must either relate to a preferred order of utilization of the four non-Koeberg sites, and only if there is incontrovertible reason for a site or sites not to be considered to be suitable for nuclear power station development at all should this conclusion be clearly stated in the draft EIR, but it needs to be for reasons other than the absence of a suitable overhead transmission line.

I note that the 3rd and 4th paragraphs of the response give a clear picture of the status of these two sites ***expressly for this EIA process***, not for future similar processes. Therefore it is clear that the misleading emphasis placed on the reasons for rejection given in **Appendix 14 Economics** needs to be amended. Perhaps there has been a lack of communication - - - .

And this is exactly where, arguably, we can see the one major concern in this DSR: it has been left to an almost inconsequential response to comments from Ms Liz McDaid to find out the status of the

Brazil and Schulpfontein sites for consideration for the successsive PWR nuclear EIA processes. It is far too important a matter to leave it thus for the draft EIR. I think that is all I need to say.

Response (65)

Comments noted. Your point that the DSR did not emphasise strongly enough that this EIA is not intended to exclude Brazil and Skulpfontein from further considered is taken. Please note however that the DSR never stated that sites would be excluded. There was also never any intention to misinform or misguide the public in any way. Should the DEA accept the recommendation for the exclusion of Brazil and Skulpfontein from further study in this EIR, it will be noted in the Draft EIR that the sites have ***not*** *been found to be flawed and unsuitable for any further consideration.*

Your comment (66)

P.7, Item n Economics, first dotted point – quoting: "*This study must include the economic benefits of the no-go option*". It is a matter of curiosity what economic benefits might accrue through the no-go option, which could seriously jeopardise the electrical generating capacity of South Africa. It leaves one wondering if it is appreciated by ELA that the country requires an additional 40 000 MW of generating capacity by 2025, of which 20 000 MW is to be provided by nuclear, the remaining 20 000 MW by a mix of non-nuclear alternates, of which coal has, luckily, been given only a minor rôle. It will also include a very interesting first of time relatively high out-put demonstration solar concentrating unit near Upington.

Can there be any economic benefits rather than serious economic disadvantages? We shall have to wait and see what the specialist determines, as well as clarifying the divergence of opinions concerning the exclusion of the Brazil and Schulpfontein sites.

Response (66)

Comments noted.

Your comment (67)

Comments form Pelindaba Working Group, quoting: "- - - *but I&APs have a right in terms of NEMA regulations to call for peer reviewers of their own choice, at the expense of the applicant in order to ensure unbiased reviews*".

As a registered I&AP I find it intolerably offensive that this Pelindaba Working Group are so arrogant as to imply that they are the only group who are capable of recommending independent specialists. It is not a requirement of the EIA Regulations. *I* want to know whom they propose, and what are their credentials? Are they truly independent of being affiliated to nuclear opponents' organisations? Are they South African citizens? What unequivocal evidence is this organisation able to produce against the specialists which Arcus GIBB have appointed to carry out the various tasks? What evidence are they able to provide to prove that the specialists won't be truly independent?

If the PWG is so concerned about how this EIA process is being conducted, the procedure being set out in detail by the NEM Act 27 of 1998 and EIA Assessment Regulations which fall under the ECA, did they provide any input into this legislation when it was made available for public comment? Did they submit their comments for specific regulations which would cover their concerns in the event that EIA processes for nuclear power stations were likely to become a reality?

It is very lucky for this intolerant and undemocratic organisation that it exists in a country with a magnificent democratic constitution. It is a great pity that they don't respect that constitution.

Response (67)

Comments noted. Please refer to Arcus GIBB's response to the Pelindaba Working Group's submission which is available on www.eskom.co.za/eia.

Your comment (68)

Comments from R & C Garbett, Section 1.9 Timing and delays for nuclear power, 1st paragraph of the response: a factor about the length of time that it requires to construct a nuclear power plant – in this case a PWR, but not a PBMR – surely needs to be contextualised in terms of the life of a nuclear plant compared with that for a typical wind generator. Nuclear plants are now being constructed for a 60 year life, whereas wind generators would be lucky to last for 20 years before having to be either decommissioned or reconstructed. However, in 20 years time it will be very interesting to see what public opinion will be of wind generators compared with solar concentrating generators and other renewable forms of energy systems, especially those which aren't so visually intrusive, even if they have a very large footprint.

Thus it is a moot point whether the moderately large footprint of a solar concentrating power station would be judged to be visually highly intrusive, considering the typical sparsely vegetated terrain in which one would expect to find one, necessary in order to capture sunshine effectively 8h/365d.

Response (68)

Comments noted. Please refer to Arcus GIBB's response to Robert and Christine Garbett's submission, which is available on www.eskom.co.za/eia.

Your comment (69)

Section 6 CO2 emissions: the comparison of greenhouse emissions between nuclear build and wind generators cannot be confined only to construction and component manufacture, but it must also include mining for ores, smelting and transport. We need to be strictly honest about carbon emissions, arising as they do from all possible sources. This is a rather different scenario, of course, than the virtually non-carbon emitting situation when generating electricity. That will apply until such time when carbon emitting power generation sources can be eliminated from the energy scenario.

Response (69)

Comments noted.

Your comment (70)

Comments from SCOSS, Radiation Protection, 3rd paragraph: concerning the TMI-2 accident, major aspects which contributed it were, **firstly**, inadequate plant parameter instrumentation which would have detected that a PORV hadn't closed and continued to release primary coolant as steam into the containment building when the operators thought it was closed, and they mistakenly cut off the emergency cooling water make-up supply**;** and **secondly**, a night shift team who weren't fully experienced in being able to properly assess the problem. This wasn't done until a senior reactor physicist eventually arrived at the plant.

The accident was effectively the result of inadequate plant parameter monitoring instrumentation rather than a design fault with the nuclear plant *per se*. The subsequent backfitting of adequate monitoring instrumentation in all nuclear power reactors has been highly successful in the detection of potential problems before they can cause any serious disruption of the nuclear plant. I cannot comment on how reactor operator training has been improved as this is not in my field of expertise.

The Chernobyl disaster was just that – a disaster waiting to happen. The main lesson is**:** don't design reactors with a positive reactivity coefficient. And that nuclear physics aspect must not be confused with the phenomenon of heat which is inevitably continuously emitted from a highly radioactive core at shutdown arising from fission product decay heat.

Response (70)

Comments noted. Please refer to the response to the submission by SCOSS.

Your comment (71)

Comments from Andy Gubb of WESSA, last sentence on p.3, quoting: "*The potential frisk of radiation and the safe disposal of nuclear waste have not been resolved, despite years of research. It includes the risks associated with transport of unused and spent fuel*". Having spent 33 years in a professional capacity in the nuclear energy field, one wonders how such uninformed opinions manage to prevail, despite many articles being published on these subjects in the press. All of these problems were effectively solved many years ago. As to why the known solutions haven't been implemented, I can only speculate that it's the mindset of *out of sight is out of mind*, with the spent fuel elements safely stored in the nuclear fuel pools at the power stations.

It is becoming ever more important that spent fuel isn't mistakenly disposed of in a way which will make it very difficult and expensive to recover when eventually it will be essential to reprocess that fuel in order to extract the useful nuclear fuel nuclides of uranium and trans-uranium elements for use in fast breeder reactors.

Response (71)

Comments noted. Please refer to Arcus GIBB response to the submission by Andy Gubb of WESSA, which is available on www.eskom.co.za/eia.

Your comment (72)

P.5 Site selection based on the NSIP: Here is one point that's been raised by WESSA with which I do agree, as I have already commented above. A site selection procedure, the NSIP, carried out in 1982 cannot surely be considered to be relevant now. There wasn't any EIA process, NEMA, etc, in those days, to work to in the vigorous way that is required, now.

What positive efforts have been made in the meantime to update the status of the four sites, namely Brazil, Schulpfontein, Bantamsklip and Thyspunt, in view of the new legislation? The status of these four sites should ideally have been subject to an independent EIA process to finally determine their suitability or not for nuclear power station development *per se*. Once it had been agreed which of the four non-Koeberg sites, or all of them, were suitable for nuclear power stations it would then have been clearly the responsibility of Eskom to determine in which order the nuclear power stations would be constructed on them for the relevant PWR power station EIA processes, those succeeding Nuclear-1 which have yet to be started. Thyspunt appears to be the preferred site for this Nuclear-1 project.

The five sites should, of course, have been prioritised and pre-selected a long time ago in the order of nuclear power station development which Eskom judged best suited its interests for supplying South Africa with adequate generating capacity, all factors being taken into consideration, e.g. grid accessibility**;** coolant water availability**;** terrain stability**;** effect on the environment**;** environment, climate, shopping facilities, schools, services, etc, conducive to a relatively well adjusted staff and their families.

Responses which I have read about the five sites to these various comments' documents from I&APs, and especially the four sites other than Koeberg, indicate that this nuclear EIA process is one of possibly five such processes, and that the two northern coastal sites are still under consideration for post-Nuclear-1 processes. But ***Appendix 14 Economics*** uses words which would indicate that these two sites need to be "worked out" of this current EIA process, as though it wasn't appreciated that there are another three or four similar nuclear EIA processes pending in the near future, for which these sites will need to be "worked in". Nothing should be written by any of the independent specialists with a choice of words which could prejudice the site selection for the successive nuclear EIA processes unless, for whatever reasons which I am not going to attempt to predict, it emerges that any of the four non-Koeberg sites are found to be unsuitable for nuclear power station development *per se*. In which case we would then have a different situation, which would require Eskom to reinvestigate to indentify a replacement site. Because of this possibility, arising because the four sites haven't been subjected to an indepen-dent EIA process, we are left with the debilitating scenario that clarity on site suitability for nuclear power station development has necessarily to be carried out during this Nuclear-1 process. Surely it would have been better if this hadn't been necessary?

Response (72)

Studies conducted during the NSIP were used for this EIA process as many of the factors are still relevant. However it must be noted that these are not the only studies which have been used. Every site considered during this EIA will undergo full investigation from every aspect and be completely compliant with the NEMA EIA Regulations.

Your comment (73)

P.8 Separation of site selection EIA and transmission line EIA processes: linking these two EIA processes for their "potential environmental impacts" when the 760 kV transmission lines will be coming from Mpumalanga and Gauteng was never feasible. Dealing with the EIA process for very long transmission lines up to 1 700 km can't be achieved in a single EIA process. It has to be progressed in stages, although I don't know how many km per stage. Therefore it's a very long process. Unfortunately this aspect hasn't been mentioned in the response to WESSA.

Response (73)

Your comment is noted. Please refer to the response to the submission by WESSA.

Your comment (74)

P.9 Fresh water supply: consideration could be given to installing seawater desalination plants using the exhaust steam from the generator turbines in a first stage cooling process. Perhaps this possibility will be discussed in a relevant appendix in the draft EIR. Using generated electricity to run a desalination plant with either an evaporative or reverse osmosis technology would certainly be a very extravagant use of the generated electricity. I have also mentioned earlier that such plant could possibly be designed to take the transient overload generating capacity if the nuclear plant either suffers an unplanned shutdown or there is a serious supply problem to the national grid, i.e. before the generators slows down after the steam supply has been cut off.

Response (74)

Please note that desalination plants are envisaged to be utilised at all sites. The engineering considerations will be decided at the appropriate time, once the vendor has been identified

Your comment (75)

Comments from Professor R A Hasty, WESSA: where the Brazil and Schulpfontein sites are concerned, we are falling into the very trap which I have been warning against. I will quote in full the third paragraph of the response**:** "*The Eskom Transmission Planning Division has also indicated that these two sites* [ie Brazil and Schulpfontein] *cannot be integrated into the Eskom Power Grid in time to meet the demand for power - there is insufficient time for Eskom to have the environmental impact assessment completed, procure servitudes and build the power lines in two new corridors over more than 1500 km to evacuate the power from either of these two sites to the major load centres in time to meet the required date for operation of the proposed Nuclear 1 power station. Both these two sites are thus considered to be non-viable alternatives specifically for this proposed power station (although they are alternatives for future power stations). It has thus been recommended to exclude these two sites from further investigation in this specific EIA*".

This response doesn't give me any clear impression that the very reason for these two sites not being acceptable for this Nuclear-1 project ***won't be perpetuated for the other nuclear EIA processes if the necessary transmission line EIA processes aren't started now, well in advance***. The argument that to make a start on the necessary EIA processes would not result in the required transmission line being available in time when the Nuclear-1 reactors will come into operation will remain for ever in this stage of inactivity if nothing is done in the interim to initiate those EIA processes for the successive PWR nuclear projects. There is a clear impression, whether intended or otherwise, that the issue is either being deliberately obfuscated for some reason which hasn't yet been divulged (i.e. by failing to make any comment on how the transmission lines will be dealt with in order that they will be ready in time for one of the later nuclear projects, ie Nuclear-2, 3, 4, and possibly 5), or ***a decision has been made not to initiate those transmission line EIA processes at all because it is no longer intended to use the two sites for any of the projected PWR nuclear power stations***, notwithstanding the comment in your response to the contrary.

If this is not the case, then may I respectfully point out that I am most definitely not the individual who is responsible for establishing this ambiguity which has been allowed to creep into the matter of siting for this series of PWR nuclear processes. What the mystery is about the Brazil and Schulpfontein sites that, ***in anticipation***, the necessary transmission EIA processes can't, or won't, be started needs to be openly stated.

I am aware, of course, that the EIA processes for the 765 kV transmission line to the Western Cape, and its construction, are well in hand. The lead time should give a good indication of what to expect – three years or more?

Response (75)

Comment noted.

Your comment (76)

P.3 Point 2: Professor Hasty mentions solar being dismissed as not yet sufficiently developed for large scale power generation, and he then goes on to mention solar for home water heating purposes, which would certainly alleviate the demand on the national grid. However, a basic requirement for the so-called renewables is for a system to be able to sustain generation 24/24, rather than 8/24 as in the case of power from the sun. And the three wind generators at Klipheuwel are only able to run for around 16% of their theoretical maximum because of the wind spectrum.

A complementary base load energy source to nuclear is solar concentrating, whereby the sun's heat is used to heat up a large molten salt container to a relatively high temperature, which is then used to produce steam for the electrical turbogenerators. Providing the output to maintain maximum generating capacity when the sun isn't shining isn't exceeded, such a system could be used for base load purposes. The nominal 100 MW demonstration plant proposed for construction near Upington is the largest such plant in the world so far, and

the results from it when it is eventually commissioned will undoubtedly be very closely watched by many countries – at least those with plenty of sunshine.

Response (76)

Comments noted.

Your comment (77)

Comments from Professor Philip Lloyd: the Professor raises a point on whether spent fuel reprocessing should be considered. There is no doubt that it should definitely be considered because there's a lot of residual U-238 plus transuranium radioisotopes, including some Pu-239, the amount depending on the fuel burnup. At some stage in the future the "hydrogen economy" will need to be taken far more seriously than it is at present, especially as there's still a lot of crude oil remaining to be pumped up for use, together with the continued discourse and controversy on whether or not global warming is a reality or a myth. I favour the former view-point.

To produce hydrogen energy-economically requires the use of a chemical process which works with very good efficiency at high temperatures of around 1 000 deg.C. In contrast, producing hydrogen by the electrolysis of water is hopelessly energy-intensive, making this source of hydrogen quite non-viable, economically, to use for the hydrogen economy. Two reactor types which operate at high temperatures (HTR) are fast breeders, which are being developed by the Japanese, and the pebble bed modular reactor (PBMR), a South African initiative based on an original German THTR design. Many of these reactors will be required to produce the world's hydrogen which would be put to use in fuel cells largely in motor vehicles, generating electricity to run the electric drive motors. You would expect to drive your motor vehicle into the hydrogen supply garage to replace the compressed hydrogen gas cylinder.

The uranium and transuranics recovered from spent nuclear fuel can be used in fast breeder reactors, and that's a prime reason for reprocessing spent fuel elements, on the basis that the world's supplies of uranium – and thorium – are finite.

Although there's the promise of thermonuclear power (TNP) in the future – it having had a far more chequered history since the 1970s than had been anticipated, with plasma stability over extended periods of time being extremely difficult to achieve - whether some form of high tem-perature reaction chamber could be devised to provide the facility to produce hydrogen by the energy-economical chemical process is a moot point. Certainly it isn't a priority feature which the TNP specialists will be bothering to investigate at this stage of its development. Therefore reliance for energy-economical hydrogen production will be with the use of the two HTR types I have mentioned above.

As I have also previously mentioned, it would be a mistake to place the spent fuel elements into a deep underground repository if this is going to make it very difficult to retrieve them for reprocessing. The safest place for spent fuel elements for the first 20 to 30 years after their final removal from reactor cores is in the specially designed spent fuel pool facilities at the nuclear power stations.

Response (77)

Comments noted. Spent fuel will placed in storage ponds at the reactor site for approximately 40 years. Currently the skills and technology to set up a reprocessing plant are not available in South Africa. The major reprocessing plants are located in England, France and Japan.

Your comment (78)

P.6 Page 4.24 in the table: the response hasn't answered the question asked by Professor Lloyd how many workers received the accumulated dose. Having to work backwards from the individual figures isn't the most helpful answer because it needs to indicate how many employees were involved with the quoted accumulative dose figure. Also to give an indication whether fewer employees would result in an increased individual average dose and more employees in a reduced individual average dose. Nuclear power stations not only employ radiation workers, of course**:** office staff will be largely non-radiation workers. Averaging the annual accumulated personnel dose amongst all the staff gives a misleading impression of the true situation where average man-rem exposures are concerned.

Response (78)

Please refer to details as reflected in the table below:

Average dose in person-mSv for occupationally exposed workers at KNPS

2005		2006	2007	2008
Collective effective dose for the occupationally exposed workforce1 at KNPS in person-mSv (a)	2260.044	1595.508	1471.736	1498.641
Number of occupationally exposed workers (Radiation Workers) at KNPS (b)	2490	2424	2492	2556
Average dose per occupationally exposed individual in person-mSv (a/b)	0.9076	0.6582	0.5906	0.5863
ALARA Target recommended by the National Nuclear Regulator for average annual individual exposure	4 person-mSv			

Note 1: Occupationally exposed workers are trained and authorised Radiation Workers who are qualified to perform duties inside designated radiological controlled zones. Non-occupationally exposed workers i.e. office workers are not included in the dose assessment

Your comment (79)

P.8 Page 7-1 in the table: I understand Professor Lloyd's question, but not the response. Climate would only be relevant if over night winds are humid and blow shorewards carrying a burden of salt particulates, which would certainly be excessively corrosive, as was indeed found at Koeberg particularly with air intake trunking. The French had overlooked the fact that materials of construction which are suitable for use at sites well inland - where al their PWRs are located - are not necessarily suitable for marine environments.

Response (79)

Eskom is aware of the potential corrosive issues that are associated with the construction of a nuclear power station at the coast. All material engineering plant location on the site will take such issues into account.

Your comment (80)

Comments from Mr Rudi Dahlhaeuser: I, as a registered I&AP, find this man's approach thoroughly untutored and highly offensive. Take **Document p.3** as an example, where even Arcus GIBB had found it

necessary to object. **Thus:** "*The first stage of the I&AP was not carried out by independent consultants*". What proof did the man provide to demonstrate the accuracy of this statement? None. **Next:** "*The involved Consultants - - - side-lined very obviously with the applicant ESKOM*". Evidence again? None. If I had thought that there was any possibility that this might have been the case, and felt the necessity to raise the issue, I would have given clear example(s) of why I thought this to be the case. And I would have used a civilised manner to present my case. **Next:** "*Therefore is the claim that the EIA process was carried out as prescribed a perversion of the facts*". Quite obviously the man has no idea of the stages through which an EIA process has to pass. He should take the trouble to get the legislation and read it. **Next:** "*Relevant information was not available of refused*". Again the man hasn't a clue how an EIA process is carried out. He doesn't give the impression that he has any understanding that the specialists' reports have in the main yet to be prepared, from which the currently unavailable information will be provided. How information can be "refused" merely shows his ignorance of how an EIA process actually works. If there was to be any real situation for which information was refused to be given by an authoritative source, it's value to the EIA would have to be very carefully assessed before any further action was taken. Thus information might be withheld which is highly commercially sensitive and which hasn't yet been protected. The occasional opponent I&APs delight in trying to deliberately obtain such sensitive information, quite oblivious of the fact that they themselves have probably never had any opportunity in their lives to, say, invent some important manufacturing procedure which might make them rich. Thus sheer jealousy can be a motivation for trying it on.

Response (80)

Comments noted.

Your comment (81)

P.4, paragraph following para 2): It is unfortunate that Dahlhaeuser sees fit to wish to frighten people about the effects of ionizing radiations, when he obviously doesn't appreciate that the *Recommendations of the International Commission on Radiological Protection,* ICRP, makes recommendations on exposure to ionizing radiations and internal radionuclide emitters which will give radiation doses far below that which everyone receives as a result of their everyday exposure to natural ionizing radiation, including cosmic radiation, and the formation by the latter of radioactive C-14 and tritium in the earth's atmosphere. There's arguably no element more common in human tissue than carbon and, of course, water, in which tritium will be present to a minute quantity. As the response indicates, the NNR takes cognisance of these recommendations, and it is also free to recommend even more restrictive exposure limits, but not the reverse.

Response (81)

Comments noted.

Your comment (82)

P.4 3rd paragraph, quoting: "*It has to be added that during "planned purges" not only radio-activity is released into the environment but also Nobel Gases like Xenon 137 which converts almost immediately to the notoriously dangerous Cesium 137, the Nobel Gas Krypton 90 decays to Rubidium and then after minutes to the very toxic Strontium 90, Xenon 135 decays to Cesium 135 with incredible Half Life of 3 millions years and so on*".

The amounts of the radioactive Nobel gases which are released during the planned purges are in fact almost completely absorbed by the activated carbon filters through which the purged gases are released into the atmosphere. Dahlhaeuser seems to believe that the "*incredible half life*" of Cs-135 of 2.3 million years

(actually, not 3 million years) is important, presumably from the point of view of its accumulation in the environment.

There could be a need to look into the matter of publicising the measured radioactive data in the environment from the two Koeberg PWRs from the many measurements which have been made by the Koeberg Environmental Services Laboratory.

Response (82)

Comments noted.

Your comment (83)

P.4 4th paragraph, quoting: "*These" [Nobel] "gases concentrate in the food chain* - - -". Nobel gases are noted for their unreactivity, and they can't, therefore, concentrate in the food chain. Their non-volatile decay products may do so, of course, but their concentration will be minute in terms of presenting any health hazard. Nobel gases in the atmosphere can only get into the human body through being breathed in. They are noted for their high insolubility.

An interesting point to note is that, some years ago, an analytical company in Picketberg who were carrying out analytical work for an Evening Star community action group who were uptight about work carrying on at the City of Cape Town's nearby Vissershok waste disposal facility, detected the nuclide Sr-90, and it was claimed that this had been emitted from the Koeberg reactors. This was quite untrue**:** it was, in fact, residual Sr-90 which had been deposited from the atmosphere following the various atmospheric atom bomb tests which were carried out by the Americans and Russians mainly during the 1960s and early 1970s.

Response (83)

Comments noted.

Your comment (84)

P.5 1st paragraph, quoting: "*Nuclear waste must be isolated from the environment for at least 250 000 years, a physical and scientific impossibility*". Obviously Dahlhaeuser has little under-standing about plate tectonics, and erosion, and how coal and any manner of ores have remained in situ in the earth's crust for a billion years or more. Long term repository storage is both scientifically perfectly feasible and it presents few physical problems which can't be readily solved.

The 250 000 years comes from the half life of Pu-239, 24 000 years, on the basis that very little activity remains after ten half lives. With the current knowledge of plate tectonics, i.e. how the earth's crust is in motion, and the effects of erosion primarily by the dissolution and transporting effects of flowing water, there are many locations which it can be judged scientifically that 250 000 years is a very short time in terms of the earth's movement and stability, especially towards the centres of continents.

Dahlhaeuser would find it impossible to research any source of information which could sup-port his thesis that such stored spent fuel elements would somehow reach the surface and become eroded and dispersed into the environment. He might possibly find some maverick pseudo-scientist who claims that such storage isn't feasible, and who attempt to prove their point.

The siting of long term repositories would be done with extreme care, to establish from the past history of plate tectonics in regions where disposal is contemplated, that continued geo-logical stability would be assured by past history.

In fact, there is a strong likelihood that spent fuel elements will be processed for the valuable nuclear fuel which they still contain, which would be chemically separated from the unwanted fission products and their decay products. It is the latter which will most likely be finally subjected to repository disposal because most of them they have little value for any purpose.

Response (84)

Comments noted.

Your comment (85)

P.6: It would be very interesting to have Dahlhaueser's carefully considered report on the claims he makes *apropos* Marine Biology and Agriculture, to justify his statements, which are not the experience of any nuclear power station anywhere across the world, as far as I am aware. The TMI-2 accident caused absolutely no external radiation harm to anyone. The only nuclear disaster which has occurred was that at Chernobyl-4 in 1986, resulting in a large area of the country downwind of the site being declared a no-go zone. The emergency zones around nuclear power sites are not zones of restricted activity where farming is concerned. The event at a Windscale pile in 1957 was a nuclear accident, the only radioactivity which was released being radioiodine, I-131.

Rarely is one given the opportunity to read such extraordinarily interesting negative comments about any subject as Dahlhaeuser has managed to entertain us with. The extraordinary spectrum of mishaps and health harm to local populations from nuclear power stations which are described in this submission have not been supported by any positive evidence whatsoever. The many claims are certainly not supported by the experience gained over thousands of reactor operating years, with only two major problems occurring out of more than 400 operating nuclear power plants. There is a strong element of irresponsibility in painting so negative a picture of nuclear power, with not the slightest grain of substantive evidence being provided from impeccable sources to demonstrate the truth of the various claims. Especially intriguing are the claims that 20 years of successfully running two nuclear power plants doesn't provide a very strong support base on how to successfully and safely run more power stations. The AP1000 and EPR upgraded PWRs are quoted as being more complex to operate that the existing PWRs at Koeberg. This clearly demonstrates that mischievousness comes into Dahlhaueser's comments because these two upgraded PWRs have been specifically designed to simplify the operation of PWRs and simultaneously make them considerably safer to operate. As for the comment on the PBMR, Dahlhaeuser would be well advised to read up about the German THTR and the test which was carried out on it in the presence of many visitors to demonstrate its capacity to shut itself down to a safe state as the core temperature rose.

Unfortunately in a way, one has to live with such incredible naivety as Dahlhaeuser has clearly demonstrated in his comments.

Response (85)

Comments noted.

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 comments 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