

**331-618 (Safety Case for Long-Term Operation Of KNPS)  
Evolution of Redacted Rev 1a to Unredacted Rev 3**

No.	Section	Sub-section	Page	Redacted text in Rev 1a	Status in Rev 2	Status in Rev 3
1	Cover Page		1	The names of the compiler, functional responsibility and authorised persons including their signatures were redacted.	Unredacted	Unredacted
2	Table of Contents	D.1.4	4	Practical Elimination of Significant Radioactive Releases through Defence-in-Depth	Unredacted	Unredacted
3		D.1.5	5	Human Factors and Performance Consideration in the Implementation of Defence-in-Depth	Unredacted	Unredacted
4		D.1.6		Impact of PSR Deviations on Defence-in-Depth – Global Assessment (GA)	Unredacted	Unredacted
5		D.2		Impact of Deviations on DiD Levels	Unredacted	Unredacted
6		D.3		Impact of Deviations on Fundamental Safety Functions	Unredacted	Unredacted
7		List of Figures	Figure 9-4	6	Number of Fuel-leaking Assemblies for Each Cycle of Each Unit	Unredacted
8	Figure 9-5		Containment Global Leak Rate Test Results		Unredacted	Unredacted
9	List of Tables	Table D.1-1	7	Analysis of the Deviations on DiD Levels and FSFs	Unredacted	Unredacted
10		Table D.1-2		List of OT Branches Affected by More Than Five Deviations	Unredacted	Unredacted
11		Table D.2-1		Impact of Deviations on DiD Levels	Unredacted	Unredacted
12		Table D.3-1		PSR Deviations Affecting Fundamental Safety Functions	Unredacted	Unredacted
13	Executive Summary		9	"The required analysis is included in the LTO integrated preparation plan (IPP) and scheduled for completion prior to LTO."	Unredacted	Unredacted
14				"Relating to the seismic hazard,"	Unredacted	Unredacted
15				"and will be completed prior to 2024."	Unredacted	Unredacted
16				"These activities are included in the LTO IPP and scheduled for completion prior to LTO."	Unredacted	Unredacted
17				" prior to LTO (included in the LTO IPP) to resolve this deviation."	Unredacted	Unredacted
18			10	" , and are included in the PSR IIP."	Unredacted	Unredacted
19				"in the LTO IIP."	Unredacted	Unredacted
20				"The ICCP modification and another ILRT will be completed before LTO and are included in the LTO IPP."	Unredacted	Unredacted
21			13	"Eskom has embarked on a recruitment campaign to ensure adequate staff for LTO."	Unredacted	Unredacted
22				"before LTO and is included in the LTO IIP."	Unredacted	Unredacted
23				"Major expenditure for Koeberg is associated with salaries (operational cost) and the safety improvements in the nuclear technical plan (capital costs). "	Unredacted	Unredacted
24		"A skills, time, and cost analysis were conducted for the PSR IIP and concluded that the cost requirements for the PSR IIP were in line with past approved expenditure for a similar scope of activities. "	Unredacted	Unredacted		
25	4.3 References	4.3.1 Normative	27	Reference [1] - "07092-A: " Reference [2] - "07147DPDRR0012: "	Unredacted	Unredacted

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26			30	Reference [76] - "(Z:\NalApp\ 240-166828385 Cable Master List)" "[78] 240-167231099: Assessment of the Spent Fuel Pool for Long Term Operation" "[89]32-T-IPDK-002: Interim Seismic Evaluation for Koeberg NPS" "[90]32-T-IPDK-008: Koeberg Switchboard, Switchboard Components, and Plant Cabling Evaluation for LTO"	Unredacted	Unredacted
27			31	"[107]331-33: PSA Updating and Maintenance"	Unredacted	Unredacted
28			32	"[123]DB2015-0020: System Design Engineering Acceptance of the Unit 1 ILRT [Outage 121] Structural Integrity Results" "[124]DB2016-0002: System Design Engineering Acceptance of the Unit 2 ILRT [Outage 221] Structural Integrity Results"	Unredacted	Unredacted
29			35	Reference [210] - "NSIP04129: " Reference [216] - "PSA-R-T19-01: "	Unredacted	Unredacted
30	6.1 Limitations Related to the Facility	6.1.1 Design Service Life Limitation	42	"is often referred to as the "technical safety reference for Koeberg" due to the similarity in design to Koeberg, its rigorous safety improvement programme, and the close co-operation between the South African and French nuclear regulators and, as such, "	Unredacted	Unredacted
31	7.0 Description of the LTO Assessment Activities		45	"(The result could be that the gaps identified in the PSR relating to ageing management were already in the process of being addressed in the ageing management assessments, which might have had an impact on the safety significance of those gaps.) "	Unredacted	Unredacted
32	7.2 Periodic Safety Review		47	"in a PSR integrated implementation plan (IIP); "	Unredacted	Unredacted
33	7.5 Site-specific Characterisation		50	"This is in recognition of the potential to locate an additional nuclear installation(s) at the site. "	Unredacted	Unredacted
34			51	"Apart from providing information on site characteristics related to the current facility, the DSSR evaluates and demonstrates the suitability of the Duynefontyn site for accommodating additional new nuclear installation(s). This allows for assessing the cumulative radiological impact of the site on the public and the environment."	Unredacted	Unredacted
35	8.0 LTO Safety Case Methodology	8.1 Structure and Content of the Safety Case	51	"an LTO IIP (list of commitments), that is, "	Unredacted	Unredacted
36	9.1 Summary of the PSR	9.1.1 Outcomes of the Safety Factor Reviews	53	"related to the control room envelope (CRE) design"	Unredacted	Unredacted
37				"(Details of the safety improvements are discussed in § 9.1.3.) "	Unredacted	Unredacted

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38		9.1.1.1 Plant Design Review Results	54	"The above may potentially be indicative of affordability, staff resourcing issues, contractor support, or the redeployment of key resources to "higher"-priority work before project finalisation. These may also represent a nuclear safety culture concern, which will be further challenged, as implementation of the PSR safety improvements is coincident with implementation of steam generator replacement (SGR) and other improvements to support LTO."	Unredacted	Unredacted
39		9.1.1.2 Actual Condition of SSCs	56	"; however, in the case of civil structures, a certain lack of management focus with regard to the slow repairs remained a concern."	Unredacted	Unredacted
40				Under Obsolescence - ", except for a few issues highlighted, including the negative trend observed regarding the health of the personnel airlock and equipment hatch (EPP) airlock penetrations. "	Unredacted	Unredacted
41		9.1.1.6 Organisation, Management Systems, and Safety Culture Review Results	60	"Metrofile"	Unredacted	Unredacted
42	9.2 Compliance with Safety Criteria and Requirements	9.2.2 Radiological Risks	67	"The PSA risk profile is quantified in PSA-R-T19-01 (Risk Assessment Report) [216]. "	Unredacted	Unredacted
43			69	", in accordance with 331 195 (Koeberg Accident Analysis Manual) [100]. "	Unredacted	Unredacted
44			70	"in accordance with the methodology in the risk assessment report [215]"	Unredacted	Unredacted
45				"These requirements are documented in 331-33 (PSA Updating and Maintenance) [107]. "	Unredacted	Unredacted
46		9.2.3 Current Licensing Basis	70	", with an expected update when the DSSR studies are concluded in 2024 "	Unredacted	Unredacted
47			71	"All the deviations were considered in the PSR global assessment to determine the impact of continued operation of the plant and to determine the relevant safety improvements. The PSR global assessment report assigned an identifier to all safety improvements related to regulations and regulatory guidelines as either H1 (High), M1 (Medium), or L1 (Low). All the H1 safety improvements are linked to the end of the current operational plant life; that is, they must be implemented prior to entry into LTO in order to meet all the LTO requirements. The detailed description of the identifiers is contained in the global assessment report [112]. In accordance with the categorisation, the safety improvements are contained in the LTO integration preparation plan or the LTO implementation plan in § 14.0."	Unredacted	Unredacted

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48	9.3 Specific Site Characterisation		71	"These are due to be completed in 2024."	Unredacted	Unredacted	
49			72	"The scope of the DSSR is informed by the requirements of Regulation No. R.927 (Regulations on Licensing of Sites for New Nuclear Installations) [232]. "	Unredacted	Unredacted	
50	9.3.1 Summary of the Site Characterisation Studies	9.3.1.2 Hazards Screened Out Conditionally	73 - 74	Under Loss of freshwater supply - "The facility is supplied with potable water from the municipality; however, given the impact of drought as was experienced from 2015 to 2018, reliance on municipal water supply cannot be guaranteed. Based on the scarcity of conventional local and regional water supplies in the site region, it is proposed to augment potable water with a backup system of groundwater from the Aquarius wellfield supplying a desalination plant at Koeberg. Desalination of seawater offers the best short- to long-term option for the site. "	Unredacted	Unredacted	
51			9.3.1.3 Hazards Screened In	80	"(with the exception of the seismic risk, for which an interim approach was taken, and the tsunami probabilistic studies, which are in progress) "	Unredacted	Unredacted
52				"prior to entry into LTO"	Unredacted	Unredacted	
53	9.4 Plant Design		80	"except for the design of the control rooms. "	Unredacted	Unredacted	
54			81	"The design of the control rooms does not meet the design basis in SAR II-4.5.1 (a design basis that is based on the general safety criteria of US NRC 10 CFR 50 Appendix A General Design Criteria No. 19) and, therefore, is not deemed adequate to protect the operators against radiation exposure during accident conditions. This design deficiency is further discussed in section § 9.4.2.1.3."	Unredacted	Unredacted	
55			82	", and these are listed in Appendix A"	Unredacted	Unredacted	
56	9.4.2.1 Safety-Related Design Description	9.4.2.1.1 The Radiation Barriers	82	"Zircaloy-4 alloy M5TM and the Westinghouse " "alloy ZIRLOTM "	Unredacted	Unredacted	
57			83	"Framatome M5TM " "Westinghouse Zircaloy and " "ZIRLOTM" "M5TM cladding " "ZIRLOTM"	Unredacted	Unredacted	
58			"Figure 9 4 shows the number of fuel-leaking assemblies for each fuel cycle since Outages 111 and 211 for Units 1 and 2, respectively. Since the 21st-cycle outages, there has been a decrease in the number of fuel failures. This is indicative of the robustness of the design and material choice."	Unredacted	Unredacted		
59			"Figure 9 4: Number of Fuel-leaking Assemblies for Each Cycle of Each Unit", including the figure.	Unredacted	Unredacted		

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60			84	Under steam generators - "07092A" and "(Ni-alloy 690) " Under reactor pressure vessel - "Ni-alloy 600 " and "Ni-alloy 600 " Under pressuriser - "(RCP 005 and 006 RS) "	Unredacted	Unredacted
61			85	Under Third barrier: containment building - "The investigation analysis is documented in JN465-NSE-ESKB-R-5704 (Long-Term Repair Strategies for the Containment Buildings – Expert Panel Report). "	Unredacted	Unredacted
62			86	"The actions identified to improve the programme forms are contained in the LTO IIP in § 14.0"	Unredacted	Unredacted
63		9.4.2.1.2 Spent Fuel Facilities	86	Under Fuel building - "initially designed in accordance with ANSI N 18.2-1973 and "	Unredacted	Unredacted
64				"– 240-167231099 (Assessment of the Spent Fuel Pool for Long Term Operation) [78] –"	Unredacted	Unredacted
65			87	Under Cask storage building (CSB) - "07147DPDRR0012"	Unredacted	Unredacted
66		9.4.2.1.3 Safety-related modifications	88	Under #1. Control room habitability - "These mitigating actions are listed in Appendix J (Suitability for Continued Operation) of the PSR global assessment report [112]."	Unredacted	Unredacted
67				Under #2 modification number "03030C ".	Unredacted	Unredacted
68	9.4.3 Design Basis for the Facility		88	"Framatome-" "N18.2 1973 " "(Framatome obtained the original design from Westinghouse.) "	Unredacted	Unredacted
69			89	"are documented in PSA R T19 01 (Risk Assessment Report (RAR)) [216] to " "The RAR is a design basis document and forms part of the safety case for continued safe operation. "	Unredacted	Unredacted
70	9.4.4 Application of Defence in Depth in Plant Design		91	"The adequacy of the design provisions for DiD is discussed in detail in Appendix D."	Unredacted	Unredacted
71	9.4.5 Fulfilment of the Fundamental Safety Functions	9.4.5.4 Condition of the FSFs	95	", provided the safety improvements identified in Appendix A are implemented"	Unredacted	Unredacted
72	9.4.6 Design Safety Margins and Safety Analyses	9.4.6.2 Safety Analyses	99	"limited, but "	Unredacted	Unredacted
73				"The ESEP process and evaluation are documented in 32-T-IPDK-002 (Interim Seismic Evaluation for Koeberg NPS) [89]."	Unredacted	Unredacted
74			100	"These activities are mentioned in the conclusion of the 'Interim Seismic Evaluation for Koeberg NPS' (32-T-IPDK-002) [89], and these are included in the LTO Integrated Preparation Plan, Table A.1-2."	Unredacted	Unredacted
75	9.5.1	9.5.1.4	107	"from EDF"	Unredacted	Unredacted

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76	Ageing Management Assessments	Time-Limited Ageing Analyses (TLAAs)	107-109	<p>Table 9 4: Actions for TLAAs not Validated for Entire LTO Period</p> <p>Should the results not support 60-year life, the following options will be considered:</p> <p>a)Introduction of an augmented inspection scope to address the overstepping components. This is dependent on the location of the component, its accessibility for inspection, and an inspection technique suitable for detecting the expected fatigue initiation in the component.</p> <p>b)A review of transient(s) resulting in the greatest contribution to the overstepping component cumulative usage factor (CUF) to determine whether the transient numbers can be reduced for these specific components</p> <p>c)Replacement of the component, if feasible. This essentially starts the fatigue process anew.</p> <p>The study considered effects of thermal embrittlement, which could reduce the critical crack size and allowable rate of crack propagation for the postulated defect sizes. Should the results not support 60-year life, the following options will be considered:</p> <p>a)More frequent surface inspections (existing ISI augmented module)</p> <p>b)Defect removal and repairs</p> <p>Parts of the RPVI sensitive to flaws include the core barrel upper shell-to-flange weld and core barrel shell welds in the core region. Should the results not support 60-year life, the following options</p>	Unredacted	Unredacted
77	9.5.1.5 Programmatic Aspects of Ageing Management	9.5.1.5.1 Ageing Management Programmes and Processes	113	"The action has been completed for the electrical and mechanical domains; there are six PM templates outstanding in the instrumentation domain."	Unredacted	Unredacted
78			115	"Further details on how the programme met the requirements of RG-0027 are provided in Attachment C of KBA0022CHEMJUSTIF2 (Justification for the Koeberg NPS Chemistry Operating Specifications) [153]."	Unredacted	Unredacted
79	9.5.2 Ageing Management Risk Items	9.5.2.1 Containment Building	121	"SAR II-4.2.2.2 (Test Description, Acceptance Criteria) [171] documents the ILRT leak tightness and structural integrity acceptance criteria. The leak tightness acceptance criteria are based on the US NRC 10CFR50 Appendix J. The containment test criteria are documented in the 'SRSM' (KBA0022SRSM00000) [157] under the EPP system."	Unredacted	Unredacted
80				"Figure 9 5 shows the containment global leak rate test results for both units. "	Unredacted	Unredacted

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81			121-122	"in correspondence DB2015-0020 (System Design Engineering Acceptance of the Unit 1 ILRT [Outage 121] Structural Integrity Results) [123] for Unit 1 and correspondence DB2016-0002 (System Design Engineering Acceptance of the Unit 2 ILRT [Outage 221] Structural Integrity Results) [124] for Unit 2. Complete detailed results for the containment structure and leak rates of the ILRTs are stored at Koeberg's documentation centre and can be provided on request. "	Unredacted	Unredacted
82			122	"again before 2024 "	Unredacted	Unredacted
83				"This test is included in the LTO Integrated Preparation Plan in Appendix A.1."	Unredacted	Unredacted
84				"Figure 9 5: Containment Global Leak Rate Test Results" including figure	Unredacted	Unredacted
85		9.5.2.2 Nuclear Island: Aseismic Bearings	124	Under Sheer modulus tests - "EDF has experienced an increased shear modulus. The only other plant with seismic bearings is Cruas, whose bearings consist only of neoprene components (no sliding plates). The EDF results confirmed the ultimately expected plateau of around a 37% increase in shear modulus. This value still respects the original design assumptions. Although the Koeberg shear modulus results are not of concern, given the EDF results, further testing will be performed to confirm the characteristics of the bearings."	Redacted	Unredacted
86		9.5.2.3 Ageing Management of Switchboards and Cables	125	", is documented in 32-T-IPDK-008 (Koeberg Switchboard, Switchboard Components and Plant Cabling Evaluation for LTO) [90], "	Unredacted	Unredacted
87				"Most switchboards are located [REDACTED] level in the electrical building. A few switchboards are located in areas such as the nuclear auxiliary building and the emergency diesel generator rooms. [REDACTED]"	Redacted	Unredacted but revised to remove security sensitive information as follows: <i>"Most switchboards are located in the electrical building. A few switchboards are located in areas such as the nuclear auxiliary building and the emergency diesel generator rooms. The electrical cabling is distributed throughout the plant, with most cabling located on perforated or enclosed cable trays."</i>
88				"perforated or enclosed "	Unredacted	Unredacted
89			125-126	[REDACTED]	Redacted	Removed unnecessary security sensitive information.



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90			126	"The evaluation 32-T-IPDK-008 (Koeberg Switchboard, Switchboard Components, and Plant Cabling Evaluation for LTO) [90] did not specifically evaluate all the individual codes and standards applicable to the switchboards, switchgear, switchboard components, and cables. However, a high-level analysis was performed of the applicable codes and standards documented in the plant safety review (PSR plant design review) and the SAR."	Unredacted	Unredacted
91		9.5.2.3.1	126	"Delle-Alsthom "	Unredacted	Unredacted
92		Design Adequacy of Switchboards and Cables	127	"The French electricity utility EDF has plants and electrical components similar to Koeberg in design and materials. In some cases, the EDF plants have the same switchboard types and plant cabling as Koeberg. EDF is not planning any large-scale cable replacements for its plants that exceed 40 years of operation. The EDF Saint-Alban nuclear power plant, commissioned in 1985 to 1986, has the same Delle-Alsthom-manufactured switchboards and switchgear as Koeberg and is one of the EDF plants scheduled for operation beyond 40 years; it is not planning switchboard replacements."	Unredacted	Unredacted
93				"Koeberg has experienced a few cable failures mainly due to maintenance practices or the cable installation practices playing a significant role in the failure mechanism."	Unredacted	Unredacted
94				"The EDF ageing management matrix was used to develop 240-101650256 (Koeberg Ageing Management Matrix) [29]. "	Unredacted	Unredacted
95				"of 240-156945472 (SALTO Ageing Management Assessment Report (Interim)) [55]"	Unredacted	Unredacted
96		9.5.2.3.2	128	", and EDF. "	Unredacted	Unredacted
97		Switchboards		"such as the currently obsolete 6,6 kV and 380 V switchboard protection relays and fuses will "	Unredacted	Unredacted
98		9.5.2.3.3 Cables	129	", initially focusing on the 6,6 kV power cables, which were the most susceptible to ageing. The low-frequency (0,1 Hz) tan δ cable testing method was adopted at Koeberg as the most appropriate cable test method for all cables. "  "6,6 kV "	Unredacted	Unredacted
99	9.5.3 Ageing Management of SSCs Supporting Licence-Binding Programmes	9.5.3.1 Radiation Protection Programme	131	"ARGOS 6"  "GEM 5"	Unredacted	Unredacted
100		9.5.3.4 Chemistry Monitoring Programme	132	"Crison CM 35, Orbisphere 3650 "  "Metrohm 912 "  "Nova TRI "	Unredacted	Unredacted



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101	9.6.1 Radiation Protection Programme	9.6.1.1 Radiation Protection Organisation	135	"Although"  "and the organisation has embarked on a recruitment campaign to replenish the resources. "	Unredacted	Unredacted
102		9.6.1.2		"RadPro "	Unredacted	Unredacted
103		Radiation Worker Training	136	"through RadPro"	Unredacted	Unredacted
104		9.6.1.4 Entry into Radiation Control Zones		"RadPro "	Unredacted	Unredacted
105	9.6.2 Radiation Exposure	9.6.2.1 Occupational Exposure	138 - 139	In all three cases this section "RadPro" is redacted.	Unredacted	Unredacted
106		9.6.2.4 Radiation Dose to the Public and the Environment (Normal Operations)	141-142	"(PC-CREAM software)"  "PC-CREAM"  "(CREAM)"  "NSIP04129 "	Unredacted	Unredacted
107			142	"PC-CREAM PLUME "	Unredacted	Unredacted
108				"PC-CREAM Granis "	Unredacted	Unredacted
109				"PC-CREAM DORIS"	Unredacted	Unredacted
110				"(ERICA) " including all others in text.	Unredacted	Unredacted
111				"(involving stakeholders if appropriate), "	Unredacted	Unredacted
112				"The ERICA software is described in Chapter 7 of the DSSR [209]."	Unredacted	Unredacted
113	9.7.2 Impact of Long-Term Operation	9.7.2.1	147	"PC Cosyma "	Unredacted	Unredacted
114		Emergency Plan and		"OEM (Areva), and EDF"	Unredacted	Unredacted
115	9.7.3 Impact of Long-Term Operation on Radioactive Waste Management	9.7.3.8 Transport of Radioactive Waste	156	"RadPro" redacted twice in the text.	Unredacted	Unredacted
116	9.7.4 Impact of Long-Term Operation on the Environment	9.7.4.2 Plant Design Provisions for Environment Protection	164	"if time allows"	Unredacted	Unredacted
117		9.7.4.3 AADQs and Effluent Discharge Conditions	166	"Appendix A "	Unredacted	Unredacted
118		9.7.4.4	167	Appendix C of	Unredacted	Unredacted
119		Normal Operations Environmental and Effluent Monitoring Programmes		"Appendix B of "	Unredacted	Unredacted

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120	9.7.5 Organisational Provisions for Long-Term Operation	9.7.5.2 Arrangements for Human Resources	170	"In anticipation of LTO, Eskom has embarked on a recruitment campaign to fill vacancies (employment of permanent staff) to ensure that there are adequate resources into the LTO period. Document 240-156938857 (NOU Human Resources Position Strategy on Long-Term Operation) [54] contains the evidence that demonstrates adequate arrangements for human resources."	Unredacted	Unredacted
121		9.7.5.6 Arrangements for Financial Resources	172	"Major expenditure for Koeberg is associated with salaries (operational cost) and the safety improvements in the nuclear technical plan (capital costs). "	Unredacted	Unredacted
122	9.9 Nuclear Safety Culture	9.9.2 Monitoring and Oversight of the NSC at the Nuclear Operating Unit	180	"Inavit IQ, "	Unredacted	Unredacted
123	10.0 Why it is Safe to Continue Operation (Overall Assessment for Additional 20 Years)		183	"provided that the safety improvements were to be implemented. "	Unredacted	Unredacted
124			184	"and is due to be completed prior to entry into LTO"	Unredacted	Unredacted
125			185	", provided that there is timely implementation of the safety improvements contained in the LTO IIP."	Unredacted	Unredacted
126	11.0 Safety Analysis Report		185	"letter K-28083-E"  "in correspondence letter k28083N"	Unredacted	Unredacted
127			Table 11 1: SGR and SALTO TLAAR SAR Changes	186	Projected Submission dates to the NNR are redacted.	Unredacted
128	12.0 Adopted Long-Term Operation Programme		188	", is awaiting NNR approval, and is tracked under CR110967-001CA."	Unredacted	Unredacted
129	15.0 Conclusions		192	"with timely implementation of the safety improvements contained in the LTO IIP"	Unredacted	Unredacted
130	16.0 Acceptance		193	All names are redacted.	Unredacted	Unredacted
131	17.0 Revisions		193	Compiler names are redacted.	Unredacted	Unredacted
132	18.0 Development Team		193	Names and titles of individuals redacted.	Names and titles of contractors and consultants were redacted.	Removed unnecessary security sensitive information.
133	19.0 Acknowledgements		194	Names and titles of individuals redacted.	Names and titles of contractors and consultants were redacted.	Removed unnecessary security sensitive information.
134	A.1 LTO Integrated Preparation Plan (Activities Required for LTO)	Table A.1-1: Ageing Management LTO Preparation Activities	195 - 209	Completion dates redacted.	Unredacted	Unredacted
135		Table A.1-2: LTO Preparation Activities – DSSR and Interim Seismic Hazard Analysis	210		Unredacted	Unredacted

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136		Table A.1-3: LTO Preparation Activities – PSR IIP End-of-life Linked Safety Improvements	211		Unredacted	Unredacted
137		Table A.1-4: LTO Preparation Activities – SAR Updates for Other Safety-related Programmes			Unredacted	Unredacted
138		Table A.1-5: TLAAs Reanalysed and Processed for NNR Submission			Unredacted	Unredacted
139	A.2 Activities After LTO Implementation	Table A.2-1: Activities After LTO Implementation – Ageing Management	212	Completion dates redacted.	Unredacted	Unredacted
140		Table A.2-2: Activities After LTO Implementation – PSR IIP Safety Improvements	213		Unredacted	Unredacted
141		Table A.2-3: Activities After LTO Implementation – SSR			Unredacted	Unredacted
142	Appendix B SAR Updates for LTO	Table B-1: LTO Preparation Activities – SAR Updates	214-218	Completion dates redacted.	Unredacted	Unredacted
143	Appendix D Defence-in-Depth	D.1.4 Practical Elimination of Significant Radioactive Releases through Defence-in-Depth	227	"The following severe accident conditions are described in TECDOC-1791 (Considerations on the Application of the IAEA Safety Requirements for the Design of Nuclear Power Plants) [259] and which should be considered for practical elimination:"	Unredacted	Unredacted
144			<b>The following sections were completely redacted:</b>			
145			227-228	D.1.4.1 Events that could lead to prompt reactor core damage and consequently early containment failure	Unredacted	Completely unredacted with only the following sentence added: "Subsequent to the implementation of the new SGs, ORT will be stopped."
146			228-229	D.1.4.2 Severe Accident Phenomena which could lead to Early Containment Failure	Unredacted	Unredacted
147			230	D.1.4.3 Severe Accident Phenomena which could lead to Late Containment Failure	Unredacted	Unredacted

**331-618 (Safety Case for Long-Term Operation Of KNPS)  
Evolution of Redacted Rev 1a to Unredacted Rev 3**

No.	Section	Sub-section	Page	Redacted text in Rev 1a	Status in Rev 2	Status in Rev 3	
148			230-231	D.1.4.4 Severe Accident with Containment Bypass	Unredacted	Unredacted and updated one sentence as follows: "SG replacement modification is scheduled for implementation prior to LTO."	
149			231-232	D.1.4.5 Significant Fuel Degradation in a Storage Pool	Unredacted	Unredacted	
150		D.1.6.1 Description of the Defence-in-Depth Assessment Approach	234	"The assessment was carried out by a multidisciplinary team of experts. Below is a summary of the outcomes but with an increased focus on the impact of deviations graded high and medium on each level of DiD."	Unredacted	Unredacted	
151				<b>The following sections were completely redacted:</b>			
152			235	D.1.6.2 Results of impact Analysis on Each Level of Defence-in-Depth	Unredacted	Unredacted	
153			235-237	D.1.6.3 Results of Impact Analysis on Defence-in-depth Objective Trees	Unredacted	Unredacted	
154			237	D.1.6.4 Results of Impact Analysis on Fundamental Safety Functions	Unredacted	Unredacted and the following sentence was updated: "As mentioned in § D.1.6.2, the deviations related to the control room envelope and the update of the site safety report will be resolved commensurate with their risk."	
155			239-246	D.2 Impact of Deviations on DiD Levels (Table D.2-1: Impact of Deviations on DiD Levels)	Redacted	Unredacted but revised to simplify complex technical information and remove unnecessary security sensitive information.	
156			247-248	D.3 Impact of Deviations on Fundamental Safety Functions (Table D.3-1: PSR Deviations Affecting Fundamental Safety Functions)	Redacted	Unredacted but revised to simplify complex technical information and remove unnecessary security sensitive information.	