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| **Detailed comments - The issues of VO Safety expert report do not need changes in FSAR Chapter 7** | | | | | | | | |
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| 1 | - | 2.2-2 | 7.3.1.3. | 16 | Compliance of MCR and ECR boards, WD package 34.BU.1 0.0.AP. PZ. RDR005 |  | Item 7.2.1.3 “Design bases” of the submitted revision of FSAR Chapter 7 (rev.2, June of 2018) contains Table 7.3.1.3-1 “List of design initiating events of accidents determined by the specific accident signals”. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 2 | - | 39 | 7.1 | 27 | Item 7.1.2.17 (SC17)  The text of the first sentence is technically incorrect; using such notions as “reactor startup”, “fuel insertion into the core”. Probably they should be “reactor startup”, “CR insertion into reactor core” (comment on the Russian version only).  Reply:  Comment is accepted.  The text in brackets will be as follows: “(reactor trip, containment insulation, boron injection in the core, etc.)”. |  | Section 7.1.2.17 “SS remote actuation. Manual initiation. (SC-17)” of section 7.1 “Introduction” of the submitted revision of FSAR Chapter 7 (rev.2, June of 2018) was changed, and these changes comply with the results of discussion of comment No. 39. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 3 | - | 62 | 7.2 | 34 | The scheme of temperature measurement (fig. 7.2-2) carries little information. A detailed scheme should be given as follows: "TTT (thermoelectric temperature transducer) – CDC TTT (compensation device for connection of thermoelectric transducers) – penetration – converting device – processing device – comparison with set point – coincidence – alarm – control," and it should be shown that the requirements for error values are satisfied under all operating conditions.  Agreement: Additional materials will be provided during the commissioning license stage |  | No changes were found corresponding to the decision with respect to comment No.62 on the scheme of temperature measurement (fig. 7.2-2) in section 7.2 “Reactor trip system” of the submitted FSAR Chapter 7. | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 4 | - | 63 | 7.2 | 35 | The scheme given in Figure 7.2-2 (as well as in Figures 7.2-3, 7.2-4, 7.2-5) is the enlarged scheme. The scheme of signal processing in ECPS is given in Figure 7.2-14. No presentation of more detailed information in Section 7.2 of FSAR is required according to RG 1.70  Agreement: Additional materials will be provided during the commissioning license stage |  | No additions corresponding to the discussion of comment No.63 were found in Fig. 7.2-2÷7.2-5 of section 7.2 “Reactor trip system” of submitted FSAR Chapter 7 (rev.2, June of 2018). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 5 | - | 232 | 7 | 93 | Expert assessment of protection and interlocking algorithms of safety systems. Reply: The comment is accepted.  The issues related to operation algorithms of safety systems equipment we suggest to be discussed at FSAR Chapter 6 review  Agreement: See reply 15 to OCE letter LTR-13070-63479 dated 14.12.05.  Updated algorithms will be included in Appendix D to FSAR Chapter 7, Revision 1. The final version of the algorithms will be included in the FSAR after completion of commissioning |  | Algorithms of protections and interlocks of SS (Appendices F and E) of the submitted revision of FSAR Chapter 7 (rev.2, June of 2018) were clarified | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 6 | - | 13 | 7.3.1.2.6 | 101 | In item No. 7.3.1.2.6 of PSAR, the 9th paragraph has been eliminated in FSAR.  Agreement: The PSAR paragraph 9 will be restored in rev. 1 of the FSAR |  | Item 7.3.1.2.6 of subsection 7.3.1.2 “Description of the control system for safety systems start-up” of the submitted revision of FSAR Chapter 7 (rev.2, June of 2018) was supplemented by the PSAR paragraph 9 as per the results of discussion of comment No.13. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 7 | - | 17 | APPENDIX D | 104 | In the following algorithms of book 5 of FSAR, the output signals have not been specified TFS21EZ001, TFS30EZ001, TFS31EZ001, TFS40EZ001 (page.7D-20, 7D-27, 7D-31, 7D-37).  Updated drawing will be included in Appendices A, B, C and D to Chapter 7 of the FSAR rev. 1 |  | Algorithms of protections and interlocks of component cooling circuit system of reactor compartment consumers TF (Book 5, Appendix E, sheets 7.E-279, 7.E-286, 7.E-290, 7.E-296) of the submitted revision of FSAR Chapter 7 (rev.2, June of 2018) were clarified and these clarifications are in line with the decision of comment No.17. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 8 | - | 19 | Section 6.3.1 | 106 | According to page No. 6.3.1.85 of FSAR (item No. 6.3.1.2.3) set-points for alarming of transducer No. TWNOL001 are 25, 216 and 231 whereas in page Nos. 7.А-250 to 7.A-259 the a.m. set points have not been specified.  Reply: Comments are accepted.  The set-points for alarming of TW tanks level and the transducers coordinates will be given in the FSAR Chapter 7 |  | Sheet 7.B-39 (Appendix B in column Alarming→Set point), alarming set points of level in tank TW10B003(04) of the extra borating system were set as per level meter 11TW10L001A(B) according to the decision made on comment No.19. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 9 | - | 20 | APPENDIX A | 107 | In page Nos. 7.А-250 to 254, coordinates for transducers TWNOL001А, В have not been specified  Reply: Comments are accepted.  The set-points for alarming of TW tanks level and the transducers coordinates will be given in the FSAR Chapter 7  Agreement: Reply is accepted and will be included in FSAR rev. 1 |  | Sheet 7.B-39 (Appendix B in column Sampling point→Coordinates) contains coordinates of the place for level measurement in tank TW10B003 (04) of the extra borating system as per level meter 11TW10L001A(B) according to the decision made on comment No.20. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 10 | - | 21 | APPENDIX D | 108 | According to algorithm Nos. TTWS10EE001, YZS40EY001, YZS41EY001 и 1YZS60EY005, the primary condition of pumps operation is operation of diesel generator, whereas there are some operational status that the DG could be turn-off and pumps should be turn-on. For example, when there is any leakage in primary circuit, consumers will be supplied by external network, without any supplies from network power station or DG. In the other hand, DG should be turned-on when we could not supply, our electrical consumers from nuclear power station on external network.  Agreement: Updated drawing will be included in Appendices A, B, C and D to Chapter 7 of the FSAR rev. 1. (see reply 15) |  | In protection and interlock algorithms TWS10EE001 (pump activation TW10D001, Book 6, Appendix F, sheet 7.F-7), YZS40EY001 (step startup program, Book 5, Appendix E, sheet 7.E-58), YZS41EY001 (loss of power on EPS section 10kV, Book 5, Appendix E, sheet 7.E-69), 1YZS60EY005 (leak from the primary to secondary circuit, Book 5, Appendix E, sheet 7.E-108) in the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), clarifications were made based on the results of unit commissioning. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 11 | - | 22 | APPENDIX D | 109 | In stage 0 of algorithm No. YZS40EY001 (cascade actuation)  The input signal "А04" of algorithm No. TWS10EE001 comes to status "1"and pump No. TW10D001 turns-on immediately whereas in stage 3 of algorithm No. YZS40EY001, the input signal "А06" of algorithm No. YZS40EY001 comes to status "1" after 30s delay. As a result, the output signal "В09" of algorithm No. 1YZS41EY001 comet to status "0" and at the same time if the input signals А03, А01 or А05 of algorithm No. TWS10EE001 come to status "1", the pump No. TW10D001 turns-on  Agreement: Updated drawing will be included in Appendices A, B, C and D to Chapter 7 of the FSAR rev. 1 (see reply 15) |  | In protection and interlock algorithms TWS10EE001 (pump activation TW10D001, Book 6, Appendix F, sheet 7.F-7), YZS40EY001 (step startup program, Book 5, Appendix E, sheet 7.E-58), YZS41EY001 (loss of power on EPS section 10kV, Book 5, Appendix E, sheet 7.E-69), in the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), changes were not found corresponding to the decision of comment No.22 | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 12 | - | 23 | APPENDIX D | 110 | To check the operation of valve TH15S012, in the condition that: pump No. TH15D001 is on and the flow of the a. m. pump is less than 35 m3/h, now if the water level in tank TH10В001 is more than 0.25 m, valve No. TH15S012 will be open (algorithm No. TНS15EE010). In the other view of the valve No. TH15S012 operation, this valve shall be closed based on algorithm No. TНS15EE013 when the water level is lower than 0,25 m. These common set-points (0,25 м) for valve open and close conditions will actuate this valve in open/close status frequently. We believe that a trigger is necessary here to avoid that.  Agreement: Updated drawing will be included in Appendices A, B, C and D to Chapter 7 of the FSAR rev. 1 (see reply 15) |  | In the algorithms of protection and interlocking of the system for emergency and planned cooling of the primary circuit and cooling of the fuel pool TH (7.E.2) THS15EE010 (opening TH15S012, Book 5, Appendix E, sheet 7.E-142) and THS15EE013 (closing TH15S012, Book 5, Appendix E, sheet 7.E-143) in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018), clarifications were made corresponding to the decision of comment No.23.  Remark: It is necessary to clarify in the THS15EE010 algorithm (for opening TH15S012) that the level value (TH10L001) in the TH10B001 borated water tank is 0.25m. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 13 | - | 24 | APPENDIX D | 111 | In order to provide the suction flow of the residual heat removal pump TH30D001 from the reactor coolant loop, it seems that a jumber including a control valve (namely TH93S001) shall be used to connect the down-stream of the check valve TH38S005 to upstream of the check valves TH91, 92, 94 S001.  Agreement: Updated drawing will be submitted in Appendix A, B, C and D to chapter 7 of the  FSAR, rev. 1 (see reply 15) |  | Figure B.1 Building ZA/B. Functional diagram of process control points. System for emergency and planned cooling of the primary circuit and cooling of the fuel pool TH (Book 3, Appendix B, Fig.В.1.dwg) in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018) considers the design mode of unit planned cooldown as per regular circuit for three channels of system TH10(20,40)D001 (sheet 6.3.1-96). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 14 | - | 25 | APPENDIX A | 112 | In the "List of systems connected with ТН", (page No. 7.А-191) the TD and TH50-70 systems are not included whereas in the P&I drawing the a.m. systems are connected to ТН. Moreover, according to page No. 6.3.1-7 of FSAR (Ch. 6), the ТН system is interacting with the ТА and ТК systems and not interacting with the "TB, TD, TG, TP, YC, TP, TZ" systems. In contrast to page No. 6.3.1-7, the P&I (page No.7.А-191) "TB, TD, TG, TP, YC,TP,TZ" systems are connected to ТН. Also ТА and ТК systems are not connected to ТН.  Agreement: Updated P&I diagrams (in order to match them with Chapter 6) will be provided in the FSAR, rev. 1. |  | The TH system at page No. 7.А-191 was not identified in the submitted revision of FSAR Chapter 7 (rev.2 of June 2018).  Figure B.1 Building ZA/B. Functional diagram of process control points. System for emergency and planned cooling of the primary circuit and cooling of the fuel pool TH (Book 3, Appendix B, Fig.В.1.dwg) in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018) shows that the list of systems related to TH complies with designation in the drawing and the list in sheet 6.3.1-13.  The only non-conformity of figure B.1 shall be taken note of: the figure shows the central gas supply system TP with nitrogen, which is not indicated in the diagram, but the GE takes part in the operation of creating a nitrogen "blanket" - instead of the gas blow-off system TK, which is indicated in diagram B.1.  The inclusion in the list of systems on the diagram of the TH80 iodine chemical fixation tank piping system can also be considered expedient, since it is used when filling the tanks with HZY reagents. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 15 | - | 5 | 7.2, table 7.2-7 | 117 | In table 7.2.7 of FSAR the column for "maximum error" is not mentioned, while it exists in supplement No. 1 of PSAR, Chapter 7.  Agreement: Additional materials will be provided during the commissioning license stage.( See replies 62 to NNSD comments) | Calculated errors of parameter measurement | No changes were found corresponding to the decision of comment No. 5 in Table 7.2-7 (sheet 7-67) of section 7.2 “Reactor trip system” in the submitted revision of FASR Chapter 7 (rev.2, June of 2018). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 16 | Comments to Chapter 7 of FSAR | 5 | 7.2, table 7.2-7 | 117 | In table 7.2.7 of FSAR the column for "maximum error" is not mentioned, while it exists in supplement No. 1 of PSAR, Chapter 7.  Agreement: Additional materials will be provided during the commissioning license stage.( See replies 62 to NNSD comments) | Repeat the previous line | | |
| 17 | Comments to Chapter 7 of FSAR | 13 | APPENDIX A | 123 | Comparing the RS system's documents in chapters 7 and 10 of the FSAR there are some mismatch cases, for example:   * In sheet No. 10.4.13.14 of the FSAR (Chapter 10) the "Alarm set point" of the parameter Nos. RS12/22/32/42F001 (pump RS12/22/32/42D001 flowrate) are ">75 and <25", whereas they have been mentioned as: "HA25 and HW25" in book 2 of FSAR, chapter 7, sheet 7.A-306 to 7.A- 326.   In addition, the operation value of these items is 150, which is in conflict with "Alarming setpoint" that has been specified as "HA25 and HW25". Please clarify.  In sheet Nos. 10.4.13 to 15, the "Alarm set point" of parameter Nos. RS12/22/32/42 T002 (Temperature of the motor hot air) is ">110", whereas in book 2 of FSAR, Chapter 7, (sheet No. 7.A.308), "alarm set point" has not been mentioned (for instance: for item No. 11RS12T002 the relevant set point has not been mentioned). Please clarify.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to FSAR Chapter 7, rev. 1 |  | Failure to identify availability of TH system in sheets 7.А-306÷7.А-326 of FSAR Chapter 7 (rev.2, June of 2018).  Table 10.4.13.3-1 “Parameters monitored of the emergency feedwater system (RS) (sheet 10.4.13-14) contains alarm set points for pump flow rate RS12/22/32/42D001 which equal to “>75 и <25”. Sheets 7.В-95, 100, 105 and 111 (columns "Alarming"→"Set point") contain changes in values of set points - "HW>75” and "LW<25".  Sheets 7.В-97, 102, 107 and 113 also contain alarm set point for temperature of hot air of engine RS12/22/32/42Т002(Т003) – "HW≥110". | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 18 | Comments to Chapter 7 of FSAR | 14 | APPENDIX A | 124 | Comparing P&ID diagrams of the RS system in the FSAR book 2 of chapter 7 and chapter 10 (sheet Nos. 7.A.305 and 10.4.13-5 respectively), the emergency filling branch of the tank Nos. RS10B001, 2, 3 & 4 has not been given in FSAR, Chapter 10, please clarify.  Agreement: Rev. 1 of FSAR shall be revised according to the reply |  | Figure 10.4.13.2.1-1 “Process diagram of emergency feed water system” (sheet 10.4.13-5) was amended in terms of emergency filling the demineralized water tanks RS10,20,30,40B001 | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 19 | Comments to Chapter 7 of FSAR | 15 | APPENDIX A  and D | 125 | Concerning book 2 of the FSAR Chapter 7, sheet Nos. 327 to 336 (VJ system), please find our comments as follows:   * There are some mismatched cases concerning set   points between FSAR and document No. 29.BU.1ZK2.0.AK.AL.RDR001 (such as: on page No. 8, item No. 11VJ10T002, alarming set point has been mentioned as "HW>45", whereas it has not been mentioned in FSAR, Chapter 7, sheet No. 7.A-333). Please clarify.   * There are some mismatched cases in "Alarming set point" between FSAR and Doc. No. 29.BU.1ZK2.0.AK.AL.RDR001 (such as: in item No. 1188, entitled as 11VJF00A, the "Alarming set point" is "HA 510, HW 510 & HT400" in the FSAR, whereas it has been mentioned as "LW<50 & LA<400" in Doc. No. 29.BU.1ZK2.0.AK.AL.RDR001, page 8). * The algorithm entitled as VJS11EH001, has not been identified in sheet 7.D.239 to 7.D.258 of book 5 of FSAR, Chapter 7, "algorithms of protections and interlocks secured closed cooling water system VJ ZK1, ZK2 BUILDING", whereas it has been specified for some VJ system parameters such as 11VJ11F001B, sheet No. 7.A-333 (book 2 of FSAR, Chapter 7). Please add the a.m. algorithm to VJ algorithm section 7.D.10 (sheet 7.D.239 to 7.D.258)   Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the provided revision of FSAR Chapter 7 (rev. 2, June 2018), the VJ system in sheets No. 327-336 could not be identified, as well as document No. 29.BU.1ZK2.0.AK.AL.RDR001.  Sheet 7.В-119 includes the alarming set point for water temperature of the component cooling circuit up to heat exchanger VJ10B001 - "HW>45", and the set point for the flow rate of the component cooling circuit pump for essential loads VJ11D001 (11VJ11F001A) - "LW <508 and LA <400".  In 7.F.6 "VJ protection and interlock algorithms of reliable cooling water system" [[1]](#footnote-1)"an algorithm named VJS11EH001 is not found. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 20 | Comments to Chapter 7 of FSAR | 16 | APPENDIX A  and D | 126 | The functional diagrams and algorithms for a number of systems have been mentioned in book 2, 4 and 5 of FSAR, Chapter 7, please specify how the systems have been selected to be included in FSAR and why algorithms for a number of the important systems (such as: YB, YC, YA, …) have not been taken in to consideration.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | Functional diagrams and algorithms of YA, YB, YC, YD, YP, YT, YR, YQ, TA, TF, TH, TW, TJ, VE, VJ, RA, RL, RS, XQ systems are mentioned in the provided revision of FSAR Chapter 7 (rev. 2, June 2018) in books 2 and 3.  Books 2 and 3 cover functional diagrams and algorithms for the main process systems mentioned in book 1. They relate to SS and unit shutdown systems. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 21 | Comments to Chapter 7 of FSAR | 20 | APPENDIX A | 127 | The "RL" process diagram represented in the Figure A.18 (page No. 276 of book 2 of FSAR-7) is not completely compatible with the figure No. 10.4.6.2.2.1.2-1 (page No. 10.4.6-17 of chapter  10) there are considerable differences between the a.m. figures, please clarify these inconsistency and correct them accordingly.  Agreement: FSAR, rev. 1, it will be corrected (see reply 82) |  | In the provided revision of FASR Chapter 7 (rev. 2, June 2018), the functional diagram of the main feed-water system RL (book 3, Figure B.5, sheet 7.B-58) fully corresponds to the process diagram of the RL system in Figure 10.4.6.2. 1-1 (outside the ZF building) and the RL system process diagram in Figure 10.4.6.2.2.1.2-1 (in the ZF building), except for the feed water supply lines to HPH. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 22 | Comments to Chapter 7 of FSAR | 21 | APPENDIX A | 128 | On page No. 7.A-296 of the FSAR, book 2 of Chapter 7, transducer "11XQ01P001A" (item No. 1228) has been referred to algorithm No. YCS05ER101, whereas this transducer has not been used as input to the a.m. algorithm (page No. 14 of Doc. No. 28.BU.1ZA.YC.AT.TB.RDR009, letter No.c02.1/02-4734 dated 12.03.03). The same problem exists for the following items: 1228, 1229, 1230, 2636, 2638, 2639, 2656, 2657, 2658, 2600, 2607, 2608  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the presented revision of FSAR Chapter 7 (rev. 2, June 2018) in the protection and interlocking algorithms of the YC reactor pressure vessel (book 6, 7.F.11 Algorithms of protections and interlocks of the YC reactor pressure vessel, sheet 7.F.365) the input signal of algorithm "Primary circuit leak" 11YCS05ER101 is initiated by algorithm "Containment pressure ≥ 30 kPa" 11YCS05EY105, which uses the PIP signal (Sapphire-22M-DIV) 11XQ01P001A as the input signal for the pressure in the containment. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 23 | Comments to Chapter 7 of FSAR | 22 | APPENDIX A | 129 | On page No. 7.A-296 of book 2 of the FSAR, Chapter 7, the transducer "11XQ01P001A" (item No. 1228) has not been referred to algorithm No. YCS05EY105 whereas this transducer has been used as input to the algorithm YCS05EY105 (page No. 14 of the Doc. No. 28.BU.1ZA.YC.AT.TB.RDR009).  The same problem exists for the following items:  1228, 1229, 1230, 2636, 2638, 2639, 2656, 2657, 2658, 2600, 2607, 2608  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the presented revision of FSAR Chapter 7 (rev. 2, June 2018) in the protection and interlocking algorithms of the YC reactor pressure vessel (book 6, 7.F.11 Algorithms of protections and interlocks of the YC reactor pressure vessel, sheet 7.F.365) the input signal of algorithm "Primary circuit leak" 11YCS05ER101 is initiated by algorithm "Containment pressure ≥ 30 kPa" 11YCS05EY105, which uses the PIP signal (Sapphire-22M-DIV) 11XQ01P001A as the input signal for the pressure in the containment. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 24 | Comments to Chapter 7 of FSAR | 23 | APPENDIX A | 130 | On page No. 7A-296 FSAR, Book 2, Chapter 7, transducer "11XQ01P001A" (element No. 1228) was mentioned with regard to algorithm No. YCS05ER101, but this sensor was not used as input to the above-mentioned algorithm (page No. 14 Document No. 28.BU1ZA.YC.AT.TB.RDR009, letter No. 02.1/02-4734 dated 12.03.03). The same problem exists for the following items: 1228, 1229, 1230, 2636, 2638, 2639, 2656, 2657, 2658, 2600, 2607, 2608.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the presented revision of FSAR Chapter 7 (rev. 2, June 2018) in the protection and interlocking algorithms of the YC reactor pressure vessel (book 6, 7.F.11 Algorithms of protections and interlocks of the YC reactor pressure vessel, sheet 7.F.365) the input signal of algorithm "Primary circuit leak" 11YCS05ER101 is initiated by algorithm "Containment pressure ≥ 30 kPa" 11YCS05EY105, which uses the PIP signal (Sapphire-22M-DIV) 11XQ01P001A as the input signal for the pressure in the containment. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 25 | Comments to Chapter 7 of FSAR | 25 | APPENDIX A | 132 | The following transducers have been specified in page No. 7.A-276 of book 2 of the FSAR, Chapter 7, (RL-functional diagram) whereas they have not been mentioned in page Nos. 7.A-277-279.  RL61P002, RL61P001, RL61P001D, RL61T001, RL61F001A,B,D RL71P001, RL71P001D, RL71F001 A,B,D  Reply: Issue requires explanations. The mentioned transducers are given both in page А-276, and also in pages А-277…279.  Agreement: The comment will be reviewed in FSAR Rev. 1 |  | In the provided revision of FSAR Chapter 7 (rev. 2, June 2018) primary transducers (PIP) listed in the comment are indicated both in the functional diagram of the RL main feed water system (Book 3, B.4 Main feed water system - RL, figure B.5 Building ZA/B. Functional diagram of process control points. Main feed water system - RL, sheet 7.В-58) and in the list of measuring circuits of process control points of the main feed water system RL (book 3, B.4 Main feed water system - RL. List of measuring circuits of process control points, sheets 7.В-59÷7.В-64). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 26 | Comments to Chapter 7 of FSAR | 26 | APPENDIX D | 133 | While there is leak in SG1, the "BRU-A" valve of SG1 shall not be opened, therefore the output of algorithm No. 1YZS60EY005 (page No. 7.D-80 of book 4, chapter 7 of FSAR) specified as B01 shall be changed .  Reply: From output В01 of algorithm No. 1YZS60EY005 the signal is transmitted for switching on the cooling down through "BRU-A" valve of SG1, if there is leak in any other SG.  Changes are not required  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev.2, June 2018), in algorithm "Leak from primary to secondary circuits" 11YZS60EY005 (book 5, 7.E.1 Algorithms of protections and interlocks for the YZ safety system start-up, sheet 7.E-94), the signal from the output data B01 is transmitted to turn on the BRU-A of SG1 for cooldown (at a speed of 60°oC/h) according to algorithm 11RAS10EE001 only in case of leaks in SG2 ÷ 4 (presence of input data A02 ÷ 04). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 27 | Comments to Chapter 7 of FSAR | 30 | APPENDIX D | 134 | A trigger function shall be added to algorithm No. TWS10EE007 or TWS10EE014 (page Nos. 7.D-44 and 7.D-61 of book 5, chapter 7 of FSAR). Operation of the algorithm Nos. TW10EE007 and TWS10EE008 shows that the valve No. TW10S009 will be closed when pump No. TW10D001 is on (100%) and level in tank Nos. TW10B003 and TW10B004 is less than 0.25m, moreover the algorithm No. TWS10EE014 leads the a.m. valve to be opened in two different situations; firstly, the pump No. TW10D001 is off (0%) and the a.m. tanks' level is more or equal to 0.25m. Secondly, the pump No. TW10D001 is on because of the existence of leak in SG and again the a.m. tanks' level is more or equal to 0.25m. Consequently, it seems that the common set-point (0.25) for valve opening and closing conditions (when there is leak) will cause the valve be opened and closed frequently. To avoid it, we believe that a trigger function shall be added to the a.m. algorithms.  Reply: The given situation might have a place in case we are facing two failures: check valve is leaky and the valves are leaky. Their tightness level can be checked at setting activities stage. In the worst case the command from interlock of TWS10-40EE008 might be performed with ban on opening.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the algorithms "Opening of valves from the TH system" 11TWS10EE007 or "Opening of valves from tank TW10B003" 11TWS10EE014 (book 6, 7.F.1 Algorithms of protections and interlocks of the extra borating system TW, sheets 7.F-9, 7.F-26 ) in the provided revision of FSAR Chapter 7 (rev. 2, June 2018), no changes corresponding to the decision of comment No. 30 were found. | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 28 | Comments to Chapter 7 of FSAR | 31 | APPENDIX D | 135 | In algorithm No. TWSN0EE011 (page No. 7.D-58 of book 5 of FSAR, Chapter 7), it has been referred to gate valve No. TWN0S023 whereas the a.m. gate valve has not been specified in the functional diagram of TW (page No. 7.A-249 of book 2 of FSAR, Chapter 7) and ancillary system for borating pump TWN0D001 (page 45 of Doc. 29.BU.1ZAB.0.AK.OK.RDR001, letter No. 04/02-13307 dated 29.08.04).  Reply: The given valve is given in TWS10-40D001 pumps piping diagram.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the provided revision of FSAR Chapter 7 (rev. 2, June 2018), no gate valve was found in the functional diagram of the extra borating system TW (Book 3, B.2 Extra borating system - TW, figure B.3 Building ZA/B. Functional diagram of process control points. Extra borating system - TW, sheet 7.B-38).  Gate valve TW10S023 is provided in the piping of the extra borating pump TW10D001 on the distillate supply line (with a flow rate of 0.0075-0.016 m3/h) from distillate storage tanks ТН10-40В008,009 for cooling the pump plunger seals according to algorithm 11TWS10EE011 (valve opening from tank ТН10В008).  Pump piping is not reviewed in the functional diagram of the extra borating system - TW (Fig. B.3) due to presence of design limits. | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 29 | Comments to Chapter 7 of FSAR | 36 | APPENDIX A | 138 | Referring to the FSAR, Chapter 7, sheet Nos. 7.A-8 to 16, in YC system, English notes to be added beside Russian notes. For example, in sheet No. 7.A-10, "WS" of "Analog" column for items namely 10YC00P020, 10YC00P021, 10YC00P022, MCR-SP & ECR-SP to be added.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the list of measuring circuits of the process control points of reactor YC (book 2, A.1 reactor - YC. List of measuring circuits of the process control points, sheet 7.A-11) in column "information allocation “the information required in the comment is specified. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 30 | Comments to Chapter 7 of FSAR | 37 | APPENDIX A  and D | 139 | Comparing FSAR, chapter 7, Book2 and FSAR, chapter 7, Book 5 there are many parameters which have been specified by A,B and C in the former document, but in the letter document sensors are not divided as three independent sensors as inputs of algorithms. For example algorithm namely TAR80EZ001 has been specified as "Designation" of parameters namely 10YC00P007A,B&C (The first document sheet No. 7.A-8). However in the second document (sheet no. 7.D-97) just YC00P007 has been mentioned as input of algorithm TAR80EZ001. It seems that the relation of each sensor as input of each algorithm shall be shown clearly. This is the case for many other algorithms of YD system. Please clarify.  Agreement: . A clarification will be attached to the process algorithms how to use them, in the FSAR Rev. 1. |  | Clarifications were added to the process algorithms in the submitted revision of FSAR Chapter 7 (rev.2, June 2018) in the algorithms of protections and interlocks. For example: 10TAR80EZ001 (closing make-up of hydraulic tanks of the first stage). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 31 | Comments to Chapter 7 of FSAR | 41 | APPENDIX A  and D | 140 | On page No. 7.A-22 of book 2, Chapter 7, FSAR, the transducers 11YB10L003A, B, C are referenced as input to the algorithms RLS61EE003, 4, whereas the a.m. algorithms have not been included in page Nos. 7.D-164-191 of book 5, Chapter 7, FSAR ("Algorithm of protections & interlocks main feed water system-RL"). The same problem exists for transducer Nos. YB20/30/40L003A, B, C.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | Transducer 11YB10L003 was not found in the submitted revision of FSAR Chapter 7 (rev. 2, June 2018) in the algorithms of protections and interlocks of the main feed water system-RL (book 6, 7.F.5 Algorithms of protections and interlocks of the feed water system - RL, sheets 7.F- 119 ÷ 7.F-165).  Transducers YB20/30/40L003 in the algorithms and interlocks of steam generator YB are provided as input for the following algorithms:  YB20L003A, B, C - 12YBS20EY201 (emergency feed water pump activation);  YB30L003A, B, C - 13YBS30EY301 (emergency feed water pump activation), etc. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 32 | Comments to Chapter 7 of FSAR | 42 | APPENDIX A | 141 | The transducer Nos. 10YB51T001 and 10YB51T002 have been mentioned on page No. 7.A-21 of book 2, Chapter 7, FSAR, whereas on page No. 7.A-17 of the a.m. book (figure A.2, building ZA/B, functional diagram for P.M. steam generator YB10) they have not been specified. The same problem exists for transducer Nos. "10YB52T001, 2", "10YB53T001, 2", and "10YB54T001, 2".  Agreement: Rev. 1 of FSAR shall be revised according to the comment. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), transducers 10YB51T001 and 10YB51T002 (as well as 10YB52,53,54T001,002) are shown in Figure A.13 (book 2, Building ZA / B. Functional diagram of process control points. Level control system in steam generators YB50-70, sheet 7.A-225). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 33 | Comments to Chapter 7 of FSAR | 43 | APPENDIX A | 142 | According to the page No. 7.A-20 of book 2, Chapter 7, FSAR, the transducer Nos. 10YB10P006 and 10YB10P007 have been used for monitoring of tightness of SG flange connection in the secondary circuit and transducer Nos. 10YB10P004 and 10YB10P005 have been used for monitoring of tightness of SG flange connection in the primary circuit, whereas on the page No. 7.A-17 of the a.m. book the transducers 10YB10P006 and 10YB10P007 have been specified in SG flange connection in the primary circuit and the location of transducer Nos. 10YB10P004 and 10YB10P005 is not clearly specified. The same problem exists for transducer Nos.  YB20/30/40P004-7.  Agreement: Rev. 1 of FSAR shall be revised according to the comment | It is required to correct Figure 5.1.2-3 Piping and instrumentation diagram of steam generator  flange joints tightness control system | No changes were found corresponding to the decision of comment No. 43 in the functional diagram of process control points of steam generator YB10 (book 2, Figure A.2 Building ZA/B. Functional diagram of process control points. Steam generator - YB10, sheet 7.A-21) in the submitted revision of FSAR Chapter 7 (rev.2, June 2018).  Remark: Taking into account that the header flange (and the control space of the flange joint) along the primary circuit is in the header space of the steam generator, and the flange along the second one is outside the steam generator (which corresponds to the location of sensors in Figure 5.1.2-3 "Piping and instrumentation diagram of steam generator"), corrections should also be made in the list of measuring circuits of process control points of steam generator YB10 (book 2, A.2. Steam generator – YB10. List of measuring circuits of process control points, sheets 7.A-22÷7.A-26). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 34 | Comments to Chapter 7 of FSAR | 44 | APPENDIX A | 143 | On page Nos. 7.A-27 and 28 of book 2, Chapter 7, FSAR, the transducers 11YB20L001A, B, C and 12YB20L002A, B, C are referred as input to the algorithm Nos. YCS01EY123 and 10YCS01EY223 respectively, whereas the a.m. transducers have not been used as input in the a.m. algorithms (page Nos. 15 and 37 of Doc. No. 28.BU.1ZA.YC.AT.TB.RDR003, letter No. 02.1/02-8440). The same problem exists for transducer Nos. 11YB30L001A, B, C, 12YB30L002, A, B, C, 11YB40L001A, B, C and 12YB40L002A, B, C.  Reply: Comments are accepted. Supplement А will be revised. Expected date is August 2006.  Agreement: Rev. 1 of FSAR shall be revised according to the comment |  | It was not possible to identify transducers 11YB20L001A, B, C and 12YB20L002A, B, C in document 28.BU.1ZA.YC.AT.TB.RDR003.  Process algorithms "YCS01EY123 and 10YCS01EY223” as well as transducers 11YB20L001A, B, C and 12YB20L002A, B, C could not be found in the submitted revision of FSAR Chapter 7 (rev. 2, June 2018) in the algorithms of protections and interlocks of reactor pressure vessel YC (book 6, 7.F.11 Algorithms of protections and interlocks of reactor pressure vessel - YC, sheets 7.F-355 ÷ 7. F-376).  Remark: Transducers 11YB20L001A, B, C and 12YB20L002A, B, C are used as input in algorithms "Leak from primary to secondary circuit in SG2" 11YZS60EY002 and "Leak from primary to secondary circuit in SG2)" 12YZS60EY002. | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 35 | Comments to Chapter 7 of FSAR | 47 | APPENDIX A | 144 | The valve Nos. YP21, 22, 23S006, 7 shall be shown as normally closed valves. Please use the correct symbol.  Agreement: The P&ID shall be corrected |  | No changes corresponding to the decision of comment No.47 were found in the submitted revision of FSAR Chapter 7 (rev.2, June 2018) in the functional diagram of process control points of pressurizer YP (book 2, figure A.6 Building ZA/B. Functional diagram of process control points. Pressurizer - YP, sheet 7.A-49). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 36 | Comments to Chapter 7 of FSAR | 53 | APPENDIX A | 145 | In the a.m. sheet, only one sensor for measuring the pressure in the relief tank has been considered whereas in FSAR Chapter 5, two sensors have been considered.  Reply: FSAR Chapter 5 should be corrected.  Agreement: The reply is accepted. FSAR Chapter 5 should be corrected according to the comment by Contractor. |  | No changes corresponding to the decision of comment No.47 were found in the submitted revision of FSAR Chapter 7 (rev.2, June 2018) in the functional diagram of process control points of pressurizer YP (book 2, figure A.6 Building ZA/B. Functional diagram of process control points. Pressurizer - YP, sheet 7.A-49). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 37 | Comments to Chapter 7 of FSAR | 55 | APPENDIX A | 146 | In the a.m. sheet measuring circuit Nos. 11YP10L00A, B, C has not been given in P&ID diagram (sheet No. 7.A-41).  Reply: The purpose of functional diagrams is to indicate the number and location of I&C transducers. Therefore some auxiliary process lines at functional diagrams are missed.  Agreement: The P&ID shall be corrected. |  | No changes corresponding to the decision of comment No.47 were found in the submitted revision of FSAR Chapter 7 (rev.2, June 2018) in the functional diagram of process control points of pressurizer YP (book 2, figure A.6 Building ZA/B. Functional diagram of process control points. Pressurizer - YP, sheet 7.A-49) includes all measuring circuits of level in PRZ listed in the List of measuring circuits of pressurizer - YP (book 2, A.6. Pressurizer - YP. List of measuring circuits of process control points, sheets 7.A-50÷7.A-55):  10YP10L003A, B;  10YP10L004A, B, C;  11YP10L001A, B C;  12YP10L002A, B C;  13YP10L005;  14YP10L006. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 38 | Comments to Chapter 7 of FSAR | 58 | APPENDIX D | 147 | In the a.m. sheet, input No. A01 of all of the algorithms comes from algorithm No. YCR00EY001, whereas in this algorithm it has not been referred to the a.m. algorithms.  Reply: In the a.m. sheet the mentioned reference is missed. Apparently the cases in point are the sheets 318 and 319. In the absent in the FSAR algorithm YCR00EY001 there is a direct command for tripping of the PRZ Tubular Electric Heater instead of reference to algorithms YР10ЕE001-008.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018) in the algorithm "Protection against cold brittleness" 10YCR00EY001 (book 6, 7.F.11 Algorithms of protections and interlocks of reactor pressure vessel - YC, sheet 7.F-356), a direct command is implemented at the output to actuate the thermal electric heater of pressurizer instead of a reference to a set of algorithms 10YPR10EE001÷004. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 39 | Comments to Chapter 7 of FSAR | 59 | APPENDIX D | 148 | The a.m. two comments are valid for algorithms given in sheet No. 7.D-313.  Reply: In the a.m. sheet the mentioned reference is missed. Apparently the cases in point are the sheets 318 and 319. In the absent in the FSAR algorithm YCR00EY001 there is a direct command for tripping of the PRZ Tubular Electric Heater instead of reference to algorithms YР10ЕE001-008.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | It is impossible to identify algorithms on page No. 7.D-313.  In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018) in the algorithm "Protection against cold brittleness" 10YCR00EY001 (book 6, 7.F.11 Algorithms of protections and interlocks of reactor pressure vessel - YC, sheet 7.F-356), a direct command is implemented at the output to actuate the thermal electric heater of pressurizer instead of a reference to a set of algorithms 10YPR10EE001÷004. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 40 | Comments to Chapter 7 of FSAR | 61 | APPENDIX D | 149 | In sheet No. 7.D-316, comment No. 9 is valid for all of the algorithms.  Reply: Apparently the case in point is sheet 330. In this case we inform that the reference to algorithm YPS21EZ003 relates only to algorithms YPS21EZ003 and YPS23EZ003 of additional control line of Pulse-Safety Device.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | It was not possible to correlate the content of comment No. 9 with the review of algorithms for process protections and interlocks. Perhaps you mean comment No. 59?  In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), the reference to algorithm 14YPS21EZ003 (book 6, 7.F.8 Algorithms of protections and interlocks of pressurizer - YP, sheet 7.F-266) is related only to the control of electromagnetic valves YP21 ÷ 23S006.  Remark: There is no control algorithm for YP22S006 valve on the discharge line of the medium to the pressure relief tank (mentioned in the reference to algorithm 14YPS21EZ003). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 41 | Comments to Chapter 7 of FSAR | 63 | APPENDIX D | 150 | The given reactor pressure which cause the Injection valves YP11, 12, 13S002 be opened are not the same in algorithm Nos. YPR10EY005 and YPR10DP001 (which one is correct? 16.7 or 16.07 МPа  Reply: The pressure value of 16.7 MPa is determined by OKB "Gidropress" for opening of YP11, 12S001.  Agreement: The reply will be completed as follows: “Setpoint 16.07 MPa is for closed-loop operation, 16.7 MPA is a protection setpoint. It will be considered in FSAR Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in "Algorithm for regulating pressure of the primary circuit" 10YPR10DP001 (book 6, 7.F.8 Algorithms of protections and interlocks of pressurizer - YP, sheet 7.F-270), the set point value of pressure is> 16.17 MPa[[2]](#footnote-2) for opening YP11S002 valve to regulate pressure in the primary circuit by injection from the cold leg of loop No. 3 ("closed loop" operation). In the algorithm "Opening injection into the pressurizer" 10YPR10EY005 (sheet 7.F-250), the set point value of pressure is >16.7 MPa for opening valves YP11S001, YP12S001, YP13S003, YP11S002, YP12S002, YP13S002 according to the protection set point. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 42 | Comments to Chapter 7 of FSAR | 68 | APPENDIX A | 151 | In sheet No. 7.A-42, it seems that the given HW (4.8) and HT(4.8) for measuring circuit Nos. 10YP10L004A, B, C are incorrect (operating values are 8.2m).  Reply: It is incorrect in the FSAR. It should be: LW<4.8, LA<4.2, HA>4.2, HW>8.4. It will be corrected.  Agreement: The reply is accepted. FSAR, rev. 1 will be revised. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the list of measuring circuits of the process control points of pressurizer YP (book 2, A.6 pressurizer- YP. List of measuring circuits of the process control points, sheet 7.А-50), the values of set points are clarified according to the results of discussion of comment No. 68. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 43 | Comments to Chapter 7 of FSAR | 69 | APPENDIX A | 152 | In sheet No. 7.A-45, it seems that the given HA and HW (1.5m) for measuring circuit Nos. 10YP20L001A, B are incorrect (operating values are 1.7m).  Reply: It should be: LW<1.5.  Agreement: The reply is accepted. FSAR, rev. 1 will be revised. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the list of measuring circuits of the process control points of pressurizer YP (book 2, A.6 pressurizer- YP. List of measuring circuits of the process control points, sheet 7.А-53, 10YP20L001A), changes were made according to the results of discussion of comment No. 69. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 44 | Comments to Chapter 7 of FSAR | 70 | APPENDIX A | 153 | In sheet Nos. 7.A-46 and 7.A-47, signal from level meter Nos. 11, 12YP10L001A, B, C go to algorithm Nos. 1, 2, 3, 4YZ60EY001, 2, 3, 4, 5. In the a.m. algorithms respective logics have not been indicated and only one sensor has been mentioned.  Reply: In algorithms YZS60EY001-005 the following level measurements are used in PRZ: 1YP10L001 in algorithms 1YZS60EY001-005, 4YZS60EY001-005;  2YP10L002 in algorithms 2YZS60EY001-005, 3YZS60EY001-005  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the algorithms of protections and interlocks for start-up of safety systems YZ, signal from level meter YP10L001 is used in algorithms 11YZS60EY001-005, 14YZS60EY001-005 and 13YZS60EY004 (book 5, 7.E.1 Algorithms of protections and interlocks for start-up of safety systems YZ, sheets 7.E-6 ÷ 7.E-119), and signal from level meter YP10L002 is used in algorithms 12YZS60EY001-005, 13YZS60EY001-003 and 13YZS60EY005, which corresponds to the decision taken according to comment No. 70.  Remark: An exception is algorithm 13YZS60EY004 "Leakage from primary to secondary circuit in SG1" (book 5, 7.E.1 Algorithms of protections and interlocks for start-up of safety systems YZ, sheet 7.E-107), in the record of which the signal from the level meter YP10L001 is used. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 45 | Comments to Chapter 7 of FSAR | 72 | APPENDIX A | 154 | According to the table No. 5.1.2-1 of Chapter 5, FSAR, sheet No. 5-13, number of check points for temperature measurement in the cold leg of each loop is 12, whereas in page No. 7.A-48 of FSAR, book 2, Chapter 7, 11 check points have been specified for temperature measurement in the cold leg of loop 2&4. please verify.  Reply: Number of check points for temperature measurement in the cold leg of each loop is 12.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1. |  | In the submitted revision of FSAR Chapter 5 (rev. 2, December 5, 2019), according to Table 5.1.2-1 "List of control points of reactor coolant pipeline" (sheet 5-19) and Figure 5.1.2-1 "Diagram of reactor coolant pipeline” (sheet 5-18), the number of control points for measuring temperature in the cold leg of each circuit is 9, and in the hot leg - 13, which does not comply with the decision taken according to comment No. 72 and with the content of list of measuring circuits of the process control points of loop YA in which the following is provided: for cold leg YA11 - 12, for the hot leg YA12 - 27, and the diagram of the functional process control points of loop YA - 12/11/12/11 and 27/27/27/27, respectively (A.7 Loop - YA, Figure A.7 Building ZA / B. Functional diagram of process control points. Loop– YA, sheet А.7-57, List of measuring circuits of the process control points, sheets А.7-58÷А.7-93). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 46 | Comments to Chapter 7 of FSAR | 74 | APPENDIX A | 155 | According to the table No. 5.1.2-1 of Chapter 5, FSAR, sheet No. 5-13 ("list of check points of the main coolant pipeline"), in each loop it should be 2 sensors for measuring of pressure pulsation on the RCP set suction and head and one sensor for measuring of pressure pulsation at the reactor outlet that should be connected to the MCDS whereas on page No. 7.A-48 of book 2, chapter 7, FSAR, the a.m. sensors have not been specified.  Reply: For measurements on the primary circuit the following meterings are considered:  Pressure difference at RCP YA10-40P01 – for EP;  Pressure difference at RCP YA10-40P02 – for EP;  Pressure difference at RCP YA10-40P03 – for RP MCDS;  Pressure difference at RCP YA10-40P04 – for RP MCDS;  Pressure difference at SG YA10-40P05 – for MCR monitor;  Pressure at RCP head - for MCR monitor.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the list of measuring circuits of the process control points of loop YA (A.7 Loop - YA, List of measuring circuits of the process control points , sheets A.7-58 ÷ A.7-93)), pressure control points on the primary circuit correspond to the decision made in accordance with comment No. 74. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| **Item** | **Report item** | **Issue** | **Report section** | **Page** | **Comments and agreements** | **Review results** | **VO “Safety” reply** | **Agreed decision** |
| 47 | Comments to Chapter 7 of FSAR | 79 | APPENDIX A | 156 | On page Nos. 7.A-57, 60 & 63 of book 2, Chapter 7, FSAR for the following transducers, please specify the type of alarms (HA, LA, HW, LW, …) 11YA11T003A, B, C, 11YA21T003A, B, C, 11YA31T003A, B, C.  Reply: Temperature alarm LT<70 and LW<150 are used not for detection of emergency cases, but to inform the operator at cool down that the protections are not available.  Agreement: The comment is accepted. The related page will be corrected . |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the list of measuring circuits of the process control points of loop YA (A.7 Loop - YA, List of measuring circuits of the process control points, sheets A.7-58 ÷ A.7-93) alarm temperature values are specified for temperature sensors 11YA11T003A, B, C, 11YA21T003A, B, C, 11YA31T003A, B, C and 11YA41T003A, B, C which correspond to those adopted in the discussion of comment No. 74. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 48 | Comments to Chapter 7 of FSAR | 82 | APPENDIX A | 157 | On page No. 7.A-85 of book 2, Chapter 7, FSAR (YT P&I diagram), all of the pipelines have been connected to the outlet chamber of the reactor whereas according to the page No. 7.A-7 of book 2, chapter 7, FSAR (YC P&I diagram) and 6th paragraph of chapter 6.3.1.3.2.4 of FSAR, two pipelines shall be connected to the outlet chamber of the reactor and two pipelines shall be connected to the inlet chamber of the reactor.  Reply: The purpose of functional diagrams is to indicate the number and location of I&C transducers. Therefore some auxiliary process lines at functional diagrams are missed.  Agreement: It will be corrected in the final version of the FSAR |  | In the submitted revision of FSAR Chapter 7 (rev.2, June 2018), in the functional diagram of process control points of ECCS tank YT (book 2, A.8 ECCS tanks – YT, Figure A.8 Building ZA/B. Functional diagram of process control points. ECCS tanks – YT, sheet 7.A-95), all four HAs are connected to the collection chamber of the reactor, which contradicts the concept adopted in the design (section 6.3.1.3.2.4 of FSAR, sheet 6.3.1-148 and the functional diagram of the process control points of reactor YC, sheet 7.A-7 (the diagram does not quite correctly show the inlet nozzles of HA YT11,13B001).  Remark: It is necessary to strictly adhere to the design diagram for connecting the HA (diagram of the core flooding is an important aspect of ensuring emergency heat removal, and the introduction of inaccuracies into this design solution is unacceptable). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 49 | Comments to Chapter 7 of FSAR | 83 | APPENDIX A | 158 | On page No. 7.A-85 of book 2, chapter 7, FSAR, the motorized valves YT11/12/13/14S005-8 have been identified as normally open valves, whereas according to the 2nd paragraph of page No. 6.3.1-101, Chapter 6, FSAR, the a.m. valves shall be identified as normally- close valves.  Reply: The purpose of functional diagrams is to indicate the number and location of I&C transducers. Therefore some auxiliary process lines at functional diagrams are missed.  Agreement: It will be corrected in the final version of the FSAR . |  | In the submitted revision of FSAR Chapter 7 (rev.2, June 2018), in the functional diagram of process control points of ECCS tank YT (book 2, A.8 ECCS tanks – YT, Figure A.8 Building ZA/B. Functional diagram of process control points. ECCS tanks – YT, sheet 7.A-95), shut-off valves with an electric drive YT11 ÷ 14S005 ÷ 008 on the bypass line of the check valves are considered as normally open, which contradicts the process diagram adopted in the process design (section 6.3.1.3.2.5 of FSAR, sheet 6.3.1-152). | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 50 | Comments to Chapter 7 of FSAR | 93 | APPENDIX A | 159 | Alarming set points for some instruments such as 10YD10P001A, 1B, 1C do not seem to be correct (HA= 0.98, HW=0.98), please clarify. 93- In some cases "HW" for alarming set points have not been specified. As an example, please note for 10YD10T006, 10YD10T007A, 10YD10T007B, 10YD10T007, etc. Being this the case, all the alarming set points for RCPs should be checked again and reviewed throughout the document.  Reply: Given value of 0.98 MPa is specified by the RCP designer. It should testify on RCP glands failure. At NO the value is much higher. For points YD10T006 and YD10T007 HW>110, HА>120 are stipulated.  Agreement: The comment is accepted. The text will be corrected in FSAR Rev. 1. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), list of measuring circuits of process control points of reactor coolant pump set - YD (book 2, A.10 Reactor coolant pump set - YD, List of measuring circuits of process control points, sheets А.7-118÷А.7-160) contains the alarm set points which correspond to those adopted in the discussion of comment No.93. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 51 | Comments to Chapter 7 of FSAR | 99 | APPENDIX A  and D | 160 | Whilst the algorithm, entitled "YDR30EY009", has been specified as designation of items 13YD30T002A, B&C (FSAR, Chapter 7, Book 2, sheet 7.A-144), these items are not mentioned as inputs of "YDR30EY009" (FSAR Chapter 7, Book 5, sheet 7.D-282). Please clarify.  Reply: Algorithms in the FSAR should be corrected due to the following:  In algorithm YD10EY009 signal from YD10T001 is used;  In algorithm YD20EY009 signal from YD10T002 is used;  In algorithm YD30EY009 signal from YD10T002 is used;  In algorithm YD40EY009 signal from YD10T001 is used;  Agreement: The reply is accepted and FSAR Rev 1 shall be corrected according to reply. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the algorithms of protections and interlocks of RCP YD, the signal from the temperature sensors is used as follows:  the signal from YD10T001A, B, is used in algorithm YDR10EY009 "Prohibit of the RCPS start based on water temperature of the autonomous circuit";  In algorithm YDR20EY009 signal from YD20T002A, B, is used;  In algorithm YDR30EY009 signal from YD30T002A, B, is used;  In algorithm YDR40EY009 signal from YD40T001A, B, is used;  (book 6, 7.F.7 Algorithms of protections and interlocks of RCP YD, sheets 7.F-187 ÷ 7.F-245), which corresponds to the decision taken in accordance with comment No. 99. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 52 | Comments to Chapter 7 of FSAR | 100 | APPENDIX A  and D | 161 | Same as above comment, whilst the algorithm "YDR40EY003", has been specified as designation of items namely 14YD40T001A,B&C(FSAR, chapter 7, Book 2, Sheet 7.A.147), these items are not mentioned as inputs of "YDR40EY003" algorithm (FSAR, chapter7, Book5, sheet 7.D-272). Please clarify.  Reply: Algorithms in the FSAR should be corrected due to the following:  In algorithm YD10EY003 signal from YD10T001 is used;  In algorithm YD20EY003 signal from YD10T002 is used;  In algorithm YD30EY003 signal from YD10T002 is used;  In algorithm YD40EY003 signal from YD10T001 is used;  Agreement: The reply is accepted and FSAR Rev 1 shall be corrected according to reply. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the algorithms of protections and interlocks of RCP YD, the signal from the temperature sensors is used as follows:  the signal from YD10T001A, B, C, is used in algorithm YDR10EY003 "Closing the sealing water drain and opening the injection into the autonomous circuit";  In algorithm YDR20EY003 signal from YD20T002A, B, С is used;  In algorithm YDR30EY003 signal from YD30T002A, B, С is used;  In algorithm YDR40EY003 signal from YD40T001A, B, С is used;  (book 6, 7.F.7 Algorithms of protections and interlocks of RCP YD, sheets 7.F-187 ÷ 7.F-245), which corresponds to the decision taken in accordance with comment No. 100. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 53 | Comments to Chapter 7 of FSAR | 103 | APPENDIX A | 162 | Comparing Doc. No. 29.BU.1ZAB.0.AK.OK.RDR001-12 with contents of FSAR, chapter 7, Book2 (page 7.A-3), "VF" should be changed in to "VE" as follows:  "Building ZA/B. functional for PM. Service cooling water system VE for secured closed cooling water system TF-VJ". This comment should also be applied on the title of Fig.A.11 (FSAR chapter7, Book2 sheet No. 7.A-148)  Agreement: The reply is accepted and FSAR Rev 1 shall be corrected according to reply. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), the content of the Appendix A section (book 2, sheet 7.A-3) was amended: "A.11 Service water supply system VE for cooling the component cooling circuit. Figure А.11 Building ZA/B. Functional diagram of process control points. Service water supply system VE for cooling the component cooling circuit TF-VJ”, and sheet А.7-162 – "Figure А.11 Bulding ZA/B. Functional diagram of process control points. Service water supply system VE for cooling the component cooling circuit TF-VJ”, which corresponds to the decision made in accordance with comment No. 103. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 54 | Comments to Chapter 7 of FSAR | 104 | APPENDIX A | 163 | Comparing Figure A.11 (FSAR chapter 7, Book2, sheet No. 7.A-148) and Figure 6.3.2.2-1 (FSAR chapter 6, Book3 sheet No. 6.3.2-42) there are some non compliances with these two figures such as:   1. VJ30F001 and VJ20F001 in Fig. No. 6.3.2.2-1 has not been specified in Figure A.11; Please clarify. 2. VE30F002 and VE20F002 in Fig. No. A11 has not been specified in Fig. 6.3.2.2-1. Please clarify. 3. For the portion of VE system that has specified in ZK1 building:    1. VL82 and VL83 branches have not been shown in Figure 6.3.2.2-1. Please verify.    2. The icon of VJ30F001 "in Fig. No.6.3.2.2-1 is in contrast to VE30F002" in Fig.A11. Please clarify.   Agreement: FSAR Chapter 6 should be corrected. |  | In the submitted revision of FSAR Chapter 6 (rev. 2, 03.16.15), Figure 6.3.2.2-1 (sheet 6.3.2-61) has been corrected in accordance with the decision taken in accordance with comment No. 104.  Remark:   1. The VJ system control points cannot be shown in this figure as they are not related to the VE system. 2. The VE control points indicated in the comment are located in the part of the system which relates to ZK. Therefore, they are not marked on the diagram bounded by the boundaries of the ZA/B building. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 55 | Comments to Chapter 7 of FSAR | 105 | APPENDIX A | 164 | In FSAR, Chapter 7, Book2 sheet No. 7.A-148, please specify the location of VE23D001, VE22D001, VE31D001 and other pumps and equipment which are in ZM4 and ZM5 Building.  Agreement: FSAR Chapter 6 should be corrected. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the functional diagram of the process control points of the service water supply system VE for cooling the component cooling circuit (book 2, A.11 Service water supply system VE for cooling the component cooling circuit. Figure А.11 Building ZA/B. Functional diagram of process control points. Service water supply system VE for cooling the component cooling circuit, sheet 7.A-162), the location of pumps VE23D001, VE22D001, VE31D001 and others has been determined.  Remark: The location of the VE equipment mentioned in the comment, which is located in buildings ZM4 and ZM5, cannot be indicated on the diagram limited by the boundaries of building ZA/B. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 56 | Comments to Chapter 7 of FSAR | 106 | APPENDIX A | 165 | The operating value for transducers is higher than high alarm setpoint value as example: the operating value for transducer No. 10TH71P002A is 0.75Mpa, whereas the high alarm setpoint is 0.4. Please verify.  Reply: For check point TH71P002 it should be LW < 0.4 MPa. For check point TH72P002 it should be LW < 0.4 MPa.  For check point TH75L002 it should be LW < 0.05 m,. HW > 0.13 m, HA > 0.37m. For check point TH60L001 it should be LW < 13.45 m,. LA < 12.55 m, HW>13.65 m.  For check point TH60L002 it should be LW < 13.45 m,. LA < 12.55 m, HW>13.65 m  Check points TH60L003,004,005,006 are discrete signalizers of low level LA < 6.0 m. Analog value is not measured. For these points the values of rated, min and max levels are given as reference  Agreement: The comment is accepted and FSAR Rev.1 shall be corrected . |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the list of measuring circuits of the process control points of the emergency and planned cooling down system of primary circuit and spent fuel pool cooling -TH (Book 3, B.1. Emergency and planned cooling down system of primary circuit and spent fuel pool cooling - TH. List of measuring circuits of the process control points, sheets 7.В-10 ÷ 7.В-36), changes were made in accordance with the decision taken in accordance with comment No. 106. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 57 | Comments to Chapter 7 of FSAR | 107 | APPENDIX D | 166 | In algorithm TAR13EE001 page 7.D.73 of book5 FSAR Chapter 7, the output signal "B06" refer to the algorithm TAR13EE02 whereas this algorithm does not exist in "algorithms of protections and interlocks volume control system TA" page 7.D-68 to 7.D-104, Book 5, FSAR.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the algorithm "Checking the coolant balance" 10TAR13EE001 (book 6, 7.F.3 Algorithms of protections and interlocks of the blowdown-make-up system TA, sheet 7.F-38), changes were made - the output signal B06 refers to valves TA13S001,004 and algorithm 10TAR10FF902, which correspond to the decision made according to comment No. 107. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 58 | Comments to Chapter 7 of FSAR | 108 | APPENDIX D | 167 | In algorithm TAR10FF902, A01 signal is received from "B06" output of algorithm TAR13EE001 whereas "B06" output of algorithm TAR13EE001 is not sent to the TAR10FF902.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1. |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in algorithm "Calculation of leakage I primary circuit” TAR10FF902 (book 6, 7.F.3 Algorithms of protections and interlocks of the blowdown-make-up system TA, sheet 7.F-39), input A01 refers to algorithm TAR13EE001, and output B06 of algorithm TAR13EE001 is sent to TAR10FF902. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 59 | Comments to Chapter 7 of FSAR | 109 | APPENDIX D | 168 | For algorithms No. TAR10EZ002, two input signals have been named as "A03" (for interlock TAR00EY001 and operator command). Moreover, for algorithm Nos. TAR5NEZ001, two input signals have been named as "A02" (for temperatures YDN0T001 and YDN0T002) which are not correct. Please note that these comments were accepted in item No. 4 letter No. 04/02-25048 dated 04.12.05 but not implemented in FSAR.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in algorithm "Blodown floor" 10TAR13EE001 (book 6, 7.F.3 Algorithms of protections and interlocks of the blowdown-make-up system TA, sheet 7.F-35), changes were made (input А04 - signal from operator), which correspond to the decision made according to comment No. 109.  Remark: It was not possible to identify algorithm TAR5NEZ001 in the Algorithms of protections and interlocks of the blowdown-make-up system TA. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 60 | Comments to Chapter 7 of FSAR | 110 | APPENDIX D | 169 | In algorithm TAR00EY001, the output of flip-flap that is regulated by operator should be changed to mode "not" before entering to unit "&". Please note Item 1 letter No. 04/02-25048 dated 04.12.05.  Reply: Algorithm is performed correct. Operator can stop the interlock operation for 5 min for blow down connecting after short-term make-up water closing at intermediate modes .  Agreement: The comment is accepted. Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in algorithm "Absence of blowdown flow rate" 10TAR13EE001 (book 6, 7.F.3 Algorithms of protections and interlocks of the blodown-make-up system TA, sheet 7.F-34), changes were made, which correspond to the decision made according to comment No. 110. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 61 | Comments to Chapter 7 of FSAR | 111 | APPENDIX D | 170 | In the following algorithms, the type and title of the operator command in the respective input signals have not been specified:   |  |  | | --- | --- | | **Algorithm marking** | **Command name** | | TAR10EZ001 | A02 | | TAR10EZ002 | A03 | | TAR20EZ001 | A04, A05 | | TAR31EZ001 | A09 | | TAR32EZ001 | A09 | | TAR33EZ001 | A09 | | TAS64EZ001 | A03 | | TAS64EZ002 | A03 | | TAS61EZ001 | A03 | | TAS61EZ002 | A03 | | TAS62EZ001 | A03 | | TAS62EZ002 | A03 | | TAS63EZ001 | A03 | | TAS63EZ002 | A03 |   Please be informed that this comment was accepted in Item 3 of the letter No. 04/02-25048 dated 04.12.05 previously.  Agreement: The comment is accepted. It will be added in the algorithms . |  | In the submitted FSAR Chapter 7 (rev.2, June of 2018), in algorithms:  TAR10EZ001, TAR10EZ002, TAR20EZ001, TAR31EZ001, TAR32EZ001, TAR33EZ001, TAS64EZ001, TAS64EZ002, TAS61EZ001, TAS61EZ002, TAS62EZ001, TAS62EZ002, TAS63EZ001, TAS63EZ002 (book 6, 7.F.3 Algorithms of protections and interlocks of the blowdown-make-up system TA, sheet 7.F-33÷7.F-73), changes were made (the operator command - “Lift prohibition”), which correspond to the decision made according to comment No. 111. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 62 | Comments to Chapter 7 of FSAR | 112 | APPENDIX D | 171 | In some of the algorithms in page Nos. 7.D.259 up to 7.D.303 of Book5 of the FSAR some command signal refer to TA sensors, whereas these sensors do not exist in tables of instrument list (page 7-A-258 to 7.A.275) and in P & ID diagram(page No. 7.A.258).   |  |  |  | | --- | --- | --- | | **TA sensor** | **YD algorithm** | **Sheet number** | | TA61P002C | YDR10EY002 | 7. D-260 | | TA62P001C | YDR20EY002 | 7. D-264 | | TA63P001C | YDR30EY002 | 7. D-268 | | TA64P002C | YDR40EY002 | 7. D-272 |   Reply: Check points and algorithms correspond to the design. Sensor "С" is not used.  Agreement: P&ID and the list of instruments shall be corrected in FSAR Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the algorithms of protections and interlocks of RCP YD (book 6, 7.F.7 algorithms of protections and interlocks of RCP YD, sheet 7.F-187 ÷ 7.F-245 ), no corrections corresponding to the explanation given in comment No. 112 were found. | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 63 | Comments to Chapter 7 of FSAR | 116 | APPENDIX A | 172 | In page 7.A-281 to 7.A-294 some set points exist but the  related Algorithms do not exist. For example, in page 7.A-282, for set points "<5.1, <5.29,  <5.59, >6.66" there is not any algorithm  The comment is not clear, as in given pages the functional diagrams are presented  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | The subject of comment No. 116 could not be identified in the submitted revision of FSAR Chapter 7 (rev. 2, June 2018).  Perhaps this comment refers to process control points of the live steam piping system - RA, then, for example, the signal of sensors 11RA10P001A, B, C (together with the set points) is used in the following algorithms:  11RAS10EE003 ”Opening/closing SG PPSV";  11RAS10EE001 ”Control of BRU-A";  11RAS10EE004 ”Opening/closing SG PPSV"  (7.F.10 algorithms of protections and interlocks of the RA live steam system, sheets 7.F-283, 284, 328) as written in the list of measuring circuits of the RA process control points. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| **Detailed comments- The issues of VO SAFETY expert report do not need changes in FSAR7** | | | | | | | | |
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| 64 | Comments to Chapter 7 of FSAR | 117 | APPENDIX A  and D | 173 | The following Algorithms which are mentioned in pages 7.A.282- to 7.A-294 Book2, FSAR chapter7, do not exist in "Algorithms  of protections and interlocks main steam pipe line system RA" page 7.D-104 to page 7.D-164 from FSAR Book5   |  |  | | --- | --- | | **Algorithm marking** | **Algorithm marking** | | RAS10EE001 | RAS40EE001 | | RAS10EE002 | RAS40EE002 | | RAS10EE003 | RAS40EE003 | | RAS10EE004 | RAS40EE004 | | RAS10EE005 | RAS40EE005 | | RAS10EE006 | RAS40EE006 | | RAS20EE001 | RAS30EE003 | | RAS20EE002 | RAS30EE004 | | RAS20EE003 | RAS30EE005 | | RAS20EE004 | RAS30EE006 | | RAS20EE005 | RAS20EE006 |   Reply: See algorithms of protections and interlocks. Main steam pipe line system RA. Building ZA/B. 28.BU. 1 ZB.RA.AT.RDR001. Revision 1.  Draw your attention, that algorithms may be corrected due to the change of the manufacturing plant of the “steam unit” valves.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 | 7.F.10 Algorithms of protections and interlocks of the RA live steam system | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), in the algorithms of protections and interlocks the RA live steam system (book 6, 7.F.10 Algorithms of protections and interlocks of the RA live steam system, sheet 7.F-281 ÷ 7.F-354 ), changes were made corresponding to the decision made for comment No. 117.  Remark: The following algorithms are an exception: RAS10EE002, RAS20EE002, RAS40EE002,  One marking RAS10EE003 is provided for two algorithms: "Opening/closing SG PPSV" and "Closing gate valve before BRU-A". | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 65 | Comments to Chapter 7 of FSAR | 118 | APPENDIX A | 174 | In page 10-3-5 of FSAR, chapter 10 the following sensors exist, whereas these are not mentioned in page 7-A-280, to 7.A-294 Book 2 of FSAR.   |  |  | | --- | --- | | **Process control points** | **Process control points** | | 11RA10R005 | 12RA20R001 | | 10RA10R003 | 10RA20R003 | | 10RA10R004 | 10RA20R004 | | 12RA10R006 | 12RA20R002 | | 11RA10R001 | 11RA20R005 | | 11RA10R002 | 12RA20R006 | | 10RA30R003 | 10RA40R003 | | 13RA30R006 | 13RA40R006 | | 14RA30R005 | 14RA40R005 | | 10RA30R004 | 10RA40R004 | | 13RA30R001 | 14RA40R001 | | 13RA30R002 | 14RA40R002 |   Reply: See section 10.3.3 of FSAR Chapter10.  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to chapter 7 of the FSAR, Rev. 1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), the list of measuring circuits of the process control points and in the functional diagram of the process control points of the RA live steam system (book 3, B.5 Live steam piping system - RA, Figure B.6 Building ZA/B. Functional diagram of process control points. Live steam piping system - RA and list of measuring circuits of the process control points, sheet 7.В-66 and sheets 7.В-67÷7.В-80) does not contain the process control points related to activity control:  - controlling the activity of the steam-gas mixture of pipelines BRU‑A 11RA10R001/002, 12RA20R001/002, 13RA30R001/002, 14RA40R001/002;  - controlling the live steam activity in the steam line from steam generator 10RA10/20/30/40R003;  - controlling the activity of N16 steam in the steam line from steam generator 10RA10/20/30/40R004;  - equivalent dose rate of radiation in the steam line 14RA30/40R005;  - equivalent dose rate of radiation in the steam line 12RA10/20R006 and 13RA30/40R006. | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 66 | Comments to Chapter 7 of FSAR | 119 | APPENDIX A | 175 | &I Diagram for "RA system in ZB.9 Building" in sheet 7.A.280, Book 2 FSAR is different from the P & I diagram of sheet 10-3-5 chapter 10 of FSAR.  Reply: Due to change of the manufacturing plant of the “steam unit” valves, the RA system diagram in the ZB.9 building will be corrected in the FSAR Chapter 10  Agreement: Updated drawings and algorithms will be submitted in Appendices A,B,C, and D to  chapter 7 of the FSAR, Rev.1 |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), the functional diagram of the process control points of the RA live steam system (book 3, B.5 Live steam piping system - RA, Figure B.6 Building ZA/B. Functional diagram of process control points. Live steam piping system - RA, sheet 7.В-66) does comply with (except for process control points of activity of live steam pipelines) the diagram in Figure 10.3.2.1.1-1 “Process diagram of main steam lines” (sheet 10.3-6). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 67 | Comments to Chapter 7 of FSAR | 2 | 7.1.1 | 176 | Protection on local power is not acceptable. It shall be reconsidered. Even it looks that this is not considered in design e.g. for accident analysis in chapter 15 that there is no case with trip on local power. And also since protection on DNB is considered it do not seem necessary.  Generally justification is required with respect to the precision and sensitivity and reliability of measurement with in core neutron detectors… being applied for Protection on local power. In addition it shall be assessed, if it could cause scram when it is not required. e.g. what will be the condition in transients such as condition with change of xenon concentration and distribution?  Table 7.2-2 should be corrected accordingly  Agreement: Substantiation of this protection necessity shall be discussed with Gidropress during FSAR-15 consideration. |  | The submitted revision of FSAR Chapter 7 (rev. 2, June 2018) provides for protection by local parameters (sheet 7-20) as the main function of the MCDS: "b) generation of emergency protection signals according to local parameters that determine the safety of operation of the reactor core (critical power ratio, maximum linear heat rate on the surface of the fuel element)."  The analysis of a false activation of the local power protection was not found.  Table 7.2- 2 "List of design basis initiating events of accidents and criteria for initiation of emergency protection" has not changed. | The decision was not considered in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

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| 68 | Comments to Chapter 7 of FSAR | 3 | 7.1.1 | 177 | Clear information shall be provided on safety classification MCDS and its sub system and their boundaries. In this regard each safety function controlled or monitored by MCDS shall be justified. e.g.   * protection on DNB * protection on local power * LBB monitoring * etc.   Agreement: The reply is accepted. The classification of ICND SHC (4) and SIA SHC (3N) shall be refined and English abbreviations shall be provided in Table 7.7-7.  The SHC-P is for protection on DNB and local power |  | In the submitted revision of FSAR Chapter 7 (rev. 2, June 2018), the classification of MCDS engineered features according to impact on safety in accordance with PNAE G-01-011-97 is given in Table 7.7-7 "Classification of MCDS engineered features according to impact on safety" (sheet 7-223).  The classification of MCDS engineered features according to impact on safety, given in Table 7.7-7, is justified in the text of Section 7.7.1.4 "Monitoring, Control and Diagnostics System" of FSAR (sheet 7-221). | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |
| 69 | Comments to Chapter 7 of FSAR | 43 | 7.3.1 | 184 | Page 7-117 item 4.3 7.3.1.3.1 и 7.3.1.3.2   * The statement "An initial event concurrency with loss of power, external effects (shock wave, aircraft crash, seismic effects) have been considered in Chapter 3 of the PSAR". Is not correct. * The same for statement "Calculated parameter operational limits under any operating conditions and the margins between each operating mode and the level considered typical for emergency conditions onset are presented in Chapter 16 of the PSAR".   Agreement: The FSAR Rev. 1 shall be revised according to the following:   * the first bullet will be deleted from the text; * the second bullet (item 7.3.1.3.2) shall be revised; |  | In the submitted revision of FSAR Chapter 7 (rev.2, June 2018), section 7.3.1.3 "Design bases" (sheet 7-116, 118) of FSAR was amended corresponding to the decision taken in accordance with comment No. 43. | The comment was taken into account in the submitted revision of FSAR Chapter 7 (rev.2, June of 2018). |

1. In this case, it means - "VJ component cooling circuit system of essential loads" [↑](#footnote-ref-1)
2. According to the Program for regulating pressure in the primary circuit (table 5.4.10-4, sheet 5-339), the pressure above the core to open the valve is >16.07 MPa [↑](#footnote-ref-2)