

19C**Containment Event Trees (CET) for Containment Performance Sequences Initiated During Power Operation**

Appendix 19C presents the containment event trees that delineate the severe accident progression given core damage events initiated during power operation. For each containment event tree, a summary of the top events and associated inputs are provided in the following tables and figures.

Table 19C-1—Containment Event Tree #CET CF - CET for Sequences Leading to Direct Containment Failure

Event-Tree Top Event		Input Events	Description of Input Events
CET CF	Entry from CDES with containment overpressurized	CET CF (Consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees.
CET CF LABEL	Label sequences for CET CF	L2FLCET CF L2FLCET CFL (Basic event)	The input event L2FLCET CF is a flag with numerical value of 1.0 (representing rupture). The other input event (L2FLCET CFL) is a flag representing containment leakage consequence. These flags can be used for quantifying separately containment ruptures and leak frequencies. Both paths lead to release category RC 304; for the purpose of this analysis, the leakage flag has been set to 0 in post processing.

Table 19C-2—Containment Event Tree #CET ISL - CET for IS LOCA Sequences

Event-Tree Top Event		Input Events	Description of Input Events
CET ISL	Input: from IS CDES tree	CET-ISL (consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees.
CET ISL LABEL	Label sequences for CET ISL	L2FLCET ISL (Basic event)	The input event is a flag with numerical value of 1.0.
IS BL	IS LOCA break location is covered by water and scrubbed	Alt 1 - Gate- ISL SCRUB=Y Alt 2 - Gate- ISL SCRUB=N (All fault tree top gates)	Events representing the presence or absence of an overlying pool of water for fission product scrubbing. Scrubbing probability of 0 for ISLOCA initiators and 0.5 for flood SIS initiator. Alternative 1 leads to release category RC 801 and Alternative 2 leads to RC 802.

Table 19C-3—Containment Event Tree #CET LIMITED CD - CET for Sequences Identified as Limited Core Damage Cases in CDES Link Trees

Event-Tree Top Event		Input Events	Description of Input Events
CET LIMITED CD	Entry: sequences identified as limited CD in CDES link trees	CET LIMITED CD (consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees.
CET LIMITED CD LABEL	Label sequences for CET LIMITED CD	L2FLCET LIMITED CD (Basic event)	The input event is a flag with numerical value of 1.0.
T1 IVR	In-Vessel recovery	L2PH INVREC=Y (Basic event)	In vessel recovery phenomena is guaranteed to be successful in this case.
T1 CI	Containment isolated	Alt 1 – L2 CONT ISOL3+ Alt 2 – L2 CONT ISOL3- Alt 3 - L2 CONT ISOL SUC (All fault tree top gates)	Inputs are described in CET LO PRESSURE DESCRIPTION.

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
CET LO PRESSURE	ENTRY: Low pressure CDES or Depressurized HI CDES	CET LO PRESSURE (consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees or from CET1 HI PRESSURE (which also transfers here).
CET LO PRESS LABEL	Label sequences for CET LO PRESS	L2FLCET LO PRESSURE (Basic event)	The input event is flag L2FLCET LO PRESSURE which has a value of 1.0; it is used to mark sequences passing thru this CET.
		BSC L2FLCET LO PRESS (Boundary condition)	The boundary condition is used to set house event L2FLCET LO PRESS to true in the fault trees.
T1 CI	Containment isolated	Alt 1 – L2 CONT ISOL3+ Alt 2 – L2 CONT ISOL3- Alt 3 - L2 CONT ISOL SUC (All fault tree top gates)	L2 CONT ISOL3+ represents failures leading to a loss of containment isolation of 3" or greater diameter. L2 CONT ISOL3- represents failures leading to a loss of containment isolation of less than 3" diameter. L2 CONT ISOL SUC represents successful containment isolation and is true for sequences where neither GL2 CONT ISOL3+ nor GL2 CONT ISOL3- are true.

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T1 CF	No containment failure before vessel breach	Alt 2 - L2 TF1 VEARLY CF(L) (Fault tree top gate)	<p>Fault tree model for very early containment failure due to hydrogen combustion. Alt 2 is used as the input on the low pressure CET (Alt 1 is used in the high pressure CET).</p> <p>This tree represents the in-vessel phase, and applies to those low pressure sequences that started as high pressure core damage and have been depressurized in Level 2. The tree assigns to all high pressure CDES that are transferred to CET LO PRESSURE (following depressurization) a phenomenological value for containment failure due to:</p> <ul style="list-style-type: none"> • Hydrogen flame acceleration or hydrogen deflagration. • Hydrogen flame acceleration or hydrogen deflagration with hot leg rupture. <p>This fault tree is also used for shutdown plant operating states to assign containment failure probabilities due to hydrogen flame acceleration and deflagration to high pressure CDES (there is no hot leg postulated in the shutdown).</p>
T2 CFIVSE	No containment failure due to in-vessel steam explosion	Alt 2 – L2PH STM EXP INV LP (Basic event)	Basic event representing containment failure due to in-vessel steam explosion. Alt 2 is used as the input on the low pressure CET (Alt 1 is used in the high pressure CET).
T2 PFIVSE	No reactor pit damage due to lower head failure by in-vessel steam explosion	Alt 2 – L2PH STM EXP INV LP (Basic event)	Basic event modeling failure of the lower head by a steam explosion which is assumed to lead to reactor pit damage. Alt 2 is used as the input on the low pressure CET (Alt 1 is used in the high pressure CET).

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T2 VB	Melt retention in-vessel	Alt 1 - L2 TF2 VB Alt 2 - L2 TF2 VB=N (Fault tree top gates) Both alternatives use boundary condition L2 IE+0-5H	<p>The Alt 1 fault tree input is used on the failure path. This fault tree evaluates the availability of LHSI to provide injection and the operator actions required to manually actuate LHSI. Phenomenological failure is also modeled in the fault tree using the failure probabilities derived from the in-vessel recovery phenomenological evaluation. The CDES are grouped together if the same split fraction is applicable; these groups are:</p> <ul style="list-style-type: none"> • Non-LOOP high pressure transients with induced rupture or operator depressurization (TR, TRD, and TRANN). High pressure transient in shutdown is also included in this group. • Non-LOOP high pressure LOCAs with induced rupture or operator depressurization (SL, SLD, SS, and SSD). High pressure LOCA in shutdown are also included in this group. • LOOP high pressure sequences (TP, SPD, and SPD). High pressure CDES in shutdown are also included in this group. • Low pressure CDES (LL, ML, and PL). Low pressure CDES in shutdown are also included in this group. <p>All CDES in CET LO PRESSURE have already been depressurized via initiator, induced rupture, or operator depressurization.</p> <p>The Alt 2 fault tree is used on the success path for this event. Since the probability of failure at this node is relatively high (>0.05), it is necessary to manually add a quantitative assessment of the success probability. The fault tree uses the numerical complement of the in-vessel recovery failure probabilities. In this fault tree, success of the safety injection (LHSI) is under an AND gate with the phenomenological success.</p> <p>Both branches set the Boundary Condition Set IE+0-5H at this point in the event tree. This boundary condition set activates house events which allow the non-recovery of loss of offsite power to be considered in this timeframe (recovery failure between 2 hours and 7 hours) with the appropriate probabilities as assessed in Appendix F.</p>

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES

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Event-Tree Top Event		Input Events	Description of input events
T2 PFXVSE	Reactor Pit not damaged by ex-vessel steam explosion or (for hi press seqs) pit overpressure at VF	Alt 1- L2 TF2 STM EXP EXV Alt 2 - L2 TF2 STM EXP EXV = N (Fault tree top gate) Both alternatives use boundary condition L2 IE+5-25H	<p>Alt 1 fault tree input is used on the failure path for the low and high pressure CETs. Alt 1 fault tree addresses two distinct phenomena:</p> <ul style="list-style-type: none"> Ex-vessel steam explosion case (applicable to low pressure CET): ex-vessel steam explosion applicable only for low pressure sequences that started as high pressure core damage with flooded pit after hot leg rupture. Therefore, the split fractions for this scenario are applicable only in the low pressure CET with high pressure CDES and hot leg depressurization. Since hot leg rupture is a pre-condition to ex-vessel steam explosion, and hot leg rupture is postulated to occur at power only, this scenario is not applicable in shutdown. Pit overpressure case (applicable to high pressure CET): pit overpressure failures which are applicable only for high pressure vessel failures (high pressure core damage remaining at high pressure) with complete circumferential break of the vessel or not. <p>Alt 2 fault tree is used on the success path for these events to correctly assign the probability of the reactor pit avoiding damage.</p> <ul style="list-style-type: none"> Ex-vessel steam explosion case: this success path is required because the failure probability for ex-vessel steam explosion is relatively high (5E-3). Pit over pressure case: this success path is required to select the appropriate sequences as success. The basic event representing complete vessel breach L2PH CBV HP is used in another top event as well (T2 CF). Sequences without complete vessel failure in this top event should not result in a complete vessel breach in the next top event T2 CF. <p>Both branches set the Boundary Condition Set IE+5-25H at this point in the event tree. This boundary condition set activates house events which allow the non-recovery of loss of offsite power to be considered in this timeframe (recovery failure between 7 hours and 31 hours) with the appropriate probabilities.</p>

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T2 CF	No containment failure at the time of Vessel Breach	L2 T2 ER (Fault tree top gate) Boundary condition L2 IE+5-25H	The same fault tree model is used in the high pressure and low pressure CETs. Logic is set up within the fault tree to select the relevant failures for low pressure and high pressure cases. Direct containment Heating (DCH) and vessel rocketing are specific failure events for the high pressure vessel failure case. Failures due to hydrogen combustion are modeled in both CETs, with different probabilities. Note that containment failure following high pressure hydrogen combustions (flame acceleration and deflagration) are modeled with different probabilities at power and during shutdown. Boundary Condition IE+5-25H is set at this point in the event tree. This boundary condition activates house events which allow the non-recovery of loss of offsite power to be considered in this timeframe (recovery failure between 7 hours and 31 hours) with the appropriate probabilities.

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T3 MSXV	Melt stabilization ex-vessel	Alt 1 - L2 T3 CCI=N Alt 2 - L2 T3 CCI Alt 3 - L2 T3 CCI-EARLY=N Alt 4 - L2 T3 CCI-EARLY (Fault tree top gates) All alternatives use boundary condition L2 IE+5-25H	<p>Alt1 fault tree is used on pathways through the CET where there has been no damage to the reactor pit, meaning that melt transfer to the spreading area will occur in an orderly manner. This fault tree models intact reactor pit without MCCI and successful basemat flooding as follows:</p> <ul style="list-style-type: none"> • Successful basemat flooding (NOT system failure) with the probability of no MCCI occurrence given successful basemat flooding. <p>Alt 2 fault tree is used on pathways through the CET where there has been no damage to the reactor pit, meaning that melt transfer to the spreading area will occur in an orderly manner, according to the design intent. This fault tree models intact reactor pit with MCCI through two failure paths:</p> <ol style="list-style-type: none"> i. A residual probability of phenomenological failure under normal circumstances (successful basemat flooding). ii. Failure of the basemat flooding which leaves the corium in dry conditions and a probability of MCCI occurrence of 1. <p>Note that availability of subsequent active SAHRS and SAHRS sprays is not required for melt stabilization success. This is because (as shown by MAAP analysis) if passive flooding is successful, dry out of the spreading area would not occur for over 72 hours. Furthermore, in the absence of active SAHRS/sprays and wet conditions in the spreading area, overpressure of the containment would occur before 72 hours, making MCCI irrelevant.</p>

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
			<p>Alt 3 fault tree is used on pathways through the CET where the pit has been damaged by previous events and NO MCCI with successful basemat flooding. The fault tree consists of a single basic event with a probability of zero and successful basemat flooding. This deletes all Cutsets on this path; therefore sequences with Alt 3 do not need to be included in the release categories quantification. The consequences assigned in this case are RCXXX-0. Note that the success of basemat flooding is not important for this specific fault tree because it is multiplied by zero. But is rather used so that sequences passing through this fault tree do not pass through branches with failed basemat flooding in the following top events.</p>
			<p>Alt 4 fault tree is used on pathways through the CET where the pit has been damaged by previous events and MCCI is guaranteed with failed basemat flooding. Fault tree represents a guaranteed failure (100% probability of MCCI occurring) when basemat flooding has failed. The scenario with early MCCI and basemat flooding successful is not modeled as it does not lead to a different consequence and the contributions of the corresponding sequences is estimated to be small.</p>

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T3 CFH2	No late containment failure due to hydrogen deflagration or FA or quench spiking	Alt 1 - L2 T3 CF H2 Alt 2 - L2 T3 CF H2 01 (Fault tree gates) All alternatives use boundary condition L2 IE+5-25H	<p>These fault trees are used on CET pathways where containment failure has not already occurred before and at vessel failure. The Alt 1 and Alt 2 variants are used on pathways with and without MCCI occurring. This influences the hydrogen combustion failure probabilities.</p> <p>Alt 1 fault tree is used on CET pathways without MCCI and successful basemat flooding (success path of top event T3 MSXV). The fault trees model failure of the containment as follows:</p> <ul style="list-style-type: none"> • Hydrogen combustion from short term MCCI applicable to low pressure sequences only (CET Low Pressure) according to phenomenological analysis. • Pressure peak during quenching of the corium ex-vessel (for high pressure transient CDES). • Steam explosion in the spreading area¹ due to late melt relocation, only applicable when basemat flooding is successful with the appropriate melt relocation probability and has a value of 0.5 (uncertain event). <p>Alt 2 is used for sequences with MCCI (but the state of basemat flooding is unknown). The fault tree models containment failure as follows:</p> <ul style="list-style-type: none"> • Hydrogen combustion from short term MCCI applicable to low pressure sequences only (CET Low Pressure) according to phenomenological analysis. • Long term hydrogen combustions (flame acceleration) with MCCI and failed basemat flooding. This branch includes several scenarios; case with 100% PARs (applicable to both high and low pressure sequences), cases with 50% and 25% PARs availability applicable to high pressure CDES and represent the probability of PARs damage and the probability of containment damage with reduced PARs for each case. Note the probability of PARs damage in case I (in-vessel period is different for shutdown and power states, everything else is similar). • Pressure peak during quenching of the corium ex-vessel (for high pressure transient CDES) with successful basemat flooding.

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T3 STMCNTL	Containment steam pressurization controlled	Alt 1 - L2 T3 STM PCNTRL 1 Alt 2 - L2 T3 STM PCNTRL 2 (Fault tree gates) All alternatives use boundary condition L2 IE+5-25H	Alt 1 is used for sequences without prior containment failure and NO MCCI (top event T3 MSXV success path with successful basemat flooding) and Alt 2 is for sequences without prior containment failure and MCCI (top event T3 MSXV failure path and unknown basemat flooding status). For steam overpressure to be a concern, basemat flooding needs to be successful. Then a combination of SAHRs sprays and LHSI injection is used by the operator to control steam overpressure. The only difference between the fault trees representing the two alternatives is that Alt 2 requires successful basemat flooding to be successful since the incoming sequences could have both success and failure. The branch representing failure of steam control models the use of active SAHRs flooding and sprays to control the steam pressurization of the containment. Relevant operator actions are incorporated into the fault tree. The fault tree also models phenomenological failures which may lead to retention of some corium in the reactor pit, which may not be outside the circulation path of the water being cooled by SAHRs. This situation requires the operators to actuate cooling using LHSI to inject into the reactor pit; these actions are modeled in the fault tree. Note that Boundary Condition Set IE+5-25H is set to activate house events which allow the recovery of Loss of Offsite Power to be considered in the timeframe of this top event (recovery between 7 hours and 31 hours) with the appropriate probabilities as assessed for the PRA. AC power can therefore be available after LOOP initiators for the equipment modeled in the fault trees considered under this top event.

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES
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Event-Tree Top Event	Input Events	Description of input events
T3 LTCF=NO/ OP/BMT	Long term CF, Branches: 1 = No fail; 2=OP fail due to non- condensable; 3=Basemat fail	Alt 1 - L2PH LATE- CCI-CF=N Alt 2 - L2PH LATE- CCI-CF=OP Alt 3 - L2PH LATE- CCI-CF=BMT Alt 2 - L2PH LATE- CCI-CF=OPL (Basic events) Although not relevant, all alternatives use boundary condition L2 IE+5-25H

These events represent the following outcomes:

- Alt 1 no containment failure.
- Alt 2 overpressure due to non-condensables (containment rupture).
- Alt 3 basemat melt through.
- Alt 4 overpressure due to non-condensables (containment leak).

All these phenomena are assessed in the phenomenological evaluation. The events sum to 1.0 and are only applied on pathways where MCCI is ongoing.

Table 19C-4—Containment Event Tree #CET LO PRESSURE - CET for Low Pressure CDES or Depressurized HI CDES

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Event-Tree Top Event		Input Events	Description of input events
T3 CONT LK	No containment leak 1) intermediate leak, 2) early leak	Alt 1 – L2 T3 CONT LK-I Alt 2 – L2 T3 CONT LK-E Alt 3 – L2 T3 CONT LK-L Alt 1 – L2 T3 CONT LK-LCCI (FT Gates)	This top event represents cases with containment leakage from early, intermediate and late time frames. Containment leakage has been included in the PRA model by applying containment leakage probabilities to the sequences where no failures have occurred (success path). This modeling approach of grouping together containment leakage probabilities to apply them to success paths at the end of the CET is chosen for simplicity. This approach minimizes the additional sequences needed. This approach is adequate because the pressure loads considered are fast rising and leakage can only occur if there was no prior rupture. Sequences without containment failures are evaluated for leaks with the following outcomes: Alt 1- leaks at the time of vessel rupture (intermediate time frame) from direct containment heating, hydrogen flame acceleration and deflagration. Alt 2- leaks prior to vessel rupture (early time frame) from hydrogen flame acceleration and deflagration. Alt 3- leaks after vessel rupture (late timeframe without MCCI) from hydrogen loads and steam control. Alt 4- leaks after vessel rupture (late timeframe with MCCI) from hydrogen loads and steam control.
T3 SPR	SAHRS sprays actuated to control source term	Alt 1 - L2-T3 SAHRS SPR ST Alt 3 - L2 T3 SAHRS SP-CI L (Fault tree top gates) All alternatives use boundary condition L2 IE+5-25H	These fault trees represent failure of the sprays for source term mitigation (including operator failures that are different). Alt 1 event is used for all release categories except RC 200s following a loss of containment isolation. Alt 3 is used for operator actions following failure of containment isolation in low pressure scenarios.

Note:

1. The phenomenon of ex-vessel steam explosion in the spreading area is postulated to fail the containment in the long term, leading to release categories 500. It is modeled in the CET top event T3 CFH2 as this top gate fault tree corresponds to the time frame of quenching overpressure in the spreading area.

For steam explosion to occur it is necessary to have a molten corium jet penetrating stable water pool under the right initial conditions of water temperature so that a rapid generation of steam leads to steam explosion rather than quenching. The phenomenon of steam explosion in the spreading area due to late melt relocation is highly uncertain because it is believed that the initial conditions for steam explosion are not met (very small corium masses penetrating a shallow and super heated water pool). For example, ex-vessel steam explosion in the reactor pit is more likely as the initial conditions of the melt and the water pool are within the range expected to produce important pressure loads in the reactor pit. However, given that the capacity of the spreading area is much lower than that of the pit and is not expected to withstand similar loads to those evaluated in the reactor pit, this scenario was included in the CETs with a conservative modeling. This scenario is applied to sequences with the following characteristics:

- Successful basemat flooding (to create the stable water pool).
- Occurrence of latemelt relocation with the probabilities evaluated in the in-vessel recovery analysis.
- A probability of steam explosion occurrence of 0.5 (uncertain event) under the initial conditions in the spreading area.
- A probability of spreading area failure of 1 (given the low structural capacity).

Table 19C-5—Containment Event Tree #CET SGTR - CET for SGTR Sequences

Event-Tree Top Event		Input Events	Description of input events
CET SGTR	Entry: from SG CDES, sequences with FW not running	CET SGTR (consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees.
CET SGTR LABEL	Label sequences for CET SGTR	L2FLCET SGTR (Basic event)	Flag event, value = 1.0.

Table 19C-6—Containment Event Tree #CET SGTR FW - CET for SGTR Sequences, FW Running

Event-Tree Top Event		Input Events	Description of input events
CET SGTR FW	CET for SGTR sequences, FW running	CET SGTR FW (consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees.
CET SGTR FW LABEL	Label sequences for CET SGTR FW	L2FLCET SGTR FW (Basic event)	Flag event, value = 1.0.

Table 19C-7—Containment Event Tree #CET1 HI PRESSURE - Initial CET for High Pressure CDES
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Event-Tree Top Event		Input Events	Description of input events
CET1 HI PRESSURE	ENTRY: CD from a high pressure CDES	CET1 HI PRESSURE (consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees.
CET HI PRESSURE LBL	Label sequences for CET HI PRESSURE	L2FLCET1 HI PRESSURE (Basic events)	L2FLCET1 HI PRESSURE is a flag event that marks the cutsets as coming from this CET and has a value of 1.0.
T1 RCS DEP	Operator depressurization before induced SGTR occurs	L2 SYS DEPRESS (Fault tree top gate)	This fault tree models the failure of the operator to depressurize the primary system according to cues in the EOPs or in the OSSA. The failures modeled are hardware failures of the depressurization valves, operator failures and consequential failures arising from some initiating events.
FW ANY SG	Feedwater (and heat removal) to any SG	L2 SYS EFW (Fault tree top event)	This fault tree models failure of feedwater and heat removal to all steam generators. If heat removal to any SG is available, challenge to the SG tubes is avoided and there will be no thermally induced SGTR. FW is not credited with LOCA imitators where partial or fast cool down are modeled.
T1 ISGTR	No induced SGTR	Alt 1 - L2 T1 ISGT=Y Alt 2 - L2 T1 ISGT=N (Fault tree top gates)	The Alt 1 fault tree models the induced SGTR probabilities as assessed in the phenomenological evaluation. Logic in the fault tree selects the correct values for the different CDES entering this CET (transients with and without secondary depressurization, any small LOCA with secondary pressurized, 2" LOCA with secondary depressurized and 0.6" LOCA with secondary depressurized). A fault tree modeled is also included as an input to this header to model stuck open steam generator valves causing depressurization of an SG, as this influences the induced SGTR probability. The Alt 2 fault tree is used to assign the appropriate probability to the success path at this node. It is required since the failure probabilities may be high in some cases. Selection logic is included to assign the correct probabilities according to the cases entering this node.

Table 19C-7—Containment Event Tree #CET1 HI PRESSURE - Initial CET for High Pressure CDES
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Event-Tree Top Event		Input Events	Description of input events
T1 IHLR	No Induced Hot Leg Rupture	Alt 1 - L2 T1 IHLR=N Alt 2 - L2 T1 IHLR=Y (Fault tree top gates)	The Alt 2 fault tree models the induced hot leg probabilities as assessed in the phenomenological evaluation. Logic in the fault tree selects the correct values for the different CDES entering this CET the same grouping of CDES as in T1 ISGTR is used. The Alt 1 fault tree is used to assign the appropriate probability to the success path at this node. It is required since the failure probabilities may be high in some cases. Selection logic is included to assign the correct probabilities according to the cases entering this node.
LBDPR	Label according to reason for depressurization - HLR or Operator	Alt 1 - L2FLOP DEPRESS with boundary condition BCS L2FLOP DEPRESS Alt 2 - L2FLHRL DEPRESS with boundary condition BCS L2FLHLR DEPRESS (Basic events)	These events are flag events. They are used to mark cutsets with the mechanism of depressurization, as identified according to the event tree sequence. The flags are used for results interpretation.

Table 19C-8—Containment Event Tree #CET2 HI PRESSURE - CET for Low pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
CET2 HI PRESSURE	Transfer CET - non-depressurized High Pressure CDES	CET2 HI PRESSURE (consequence)	Consequence is used to mark the transfer into this CET from the CDES link event trees or from CET1 HI PRESSURE which also transfers here.
CET2 HI PRESS LABEL	Label sequences for CET2 HI PRESS	L2FLCET2 HI PRESSURE with boundary condition BCS L2FLCET LO PRES (Basic events)	L2FLCET2 HI PRESSURE flag event marks the cutsets as coming from this CET and has a value of 1.0.
T1 CI	Containment isolated	Alt 1 – L2 CONT ISOL3+ Alt 2 – L2 CONT ISOL3- Alt 3 - L2 CONT ISOL SUC (All fault tree top gates)	As explained in Low Pressure CET description.
T1 CF	No cont fail before vessel breach	Alt 1 - L2 T1 VEARLY CF(H) (Fault tree top gate)	Fault tree model for very early containment failure due to hydrogen combustion. Alt 1 is used as the input on the high pressure CET (Alt 2 is used in the low pressure CET). This tree represents the in-vessel phase, and applies to high pressure sequences that stay at high pressure. The tree assigns to all high pressure CDES that are transferred to CET2 HI PRESSURE a phenomenological value for containment failure due to: <ul style="list-style-type: none"> Hydrogen flame acceleration or hydrogen deflagration. This fault tree is also used for shutdown plant operating states to assign containment failure probabilities due to hydrogen flame acceleration and deflagration to high pressure CDES.
T2 CFIVSE	No cont fail due to in-vessel steam explosion	Alt 1 – L2PH STM EXP INV HP (Basic event)	As explained in Low Pressure CET description.

Table 19C-8—Containment Event Tree #CET2 HI PRESSURE - CET for Low pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T2 PFIVSE	No reactor pit damage due to lower head failure by in-vessel steam explosion	Alt 1 – L2PH STM EXP INV HP (Basic event)	As explained in Low Pressure CET description.
T2 PFXVSE	Reactor Pit not damaged by ex-vessel steam explosion or (for hi press seqs) pit overpressure at VF	Alt 1- GL2 TF2 STM EXP EXV Alt 2 - GL2 TF2 STM EXP EXV = N (Fault tree top gate) Both alternatives use boundary condition L2 IE+5-25H	As explained in Low Pressure CET description.
T2 CF	No containment failure at the time of Vessel Breach	L2 T2 ER (Fault tree top gate) Boundary condition L2 IE+5-25H	As explained in Low Pressure CET description.
T3 MSXV	Melt stabilization ex-vessel	Alt 1 - L2 T3 CCI=N Alt 2 - L2 T3 CCI Alt 3 - L2 T3 CCI-EARLY=N Alt 4 - L2 T3 CCI-EARLY (Fault tree top gates) All alternatives use boundary condition L2 IE+5-25H	As explained in Low Pressure CET description.

Table 19C-8—Containment Event Tree #CET2 HI PRESSURE - CET for Low pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T3 CFH2	No late containment failure due to hydrogen deflagration or FA or quench spiking	Alt 1 - L2 T3 CF H2 Alt 2 - L2 T3 CF H2 01 (Fault tree gates) All alternatives use boundary condition L2 IE+5-25H	As explained in Low Pressure CET description.
T3 STMCNTL	Containment steam pressurization controlled	Alt 1 - L2 T3 STM PCNTRL 1 Alt 2 - L2 T3 STM PCNTRL 2 (Fault tree gates) All alternatives use boundary condition L2 IE+5-25H	As explained in Low Pressure CET description.
T3 LTCF=NO/OP/BMT	Long term CF, Branches: 1 = No fail; 2=OP fail due to non-condensables; 3=Basemat fail	Alt 1 - L2PH LATE-CCI-CF=N Alt 2 - L2PH LATE-CCI-CF=OP Alt 3 - L2PH LATE-CCI-CF=BMT Alt 4 - L2PH LATE-CCI-CF=OPL (Basic events) Although not relevant, all alternatives use boundary condition L2 IE+5-25H	As explained in Low Pressure CET description.

Table 19C-8—Containment Event Tree #CET2 HI PRESSURE - CET for Low pressure CDES or Depressurized HI CDES
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Event-Tree Top Event		Input Events	Description of input events
T3 CONT LK	No containment leak 1) intermediate leak, 2) early leak	Alt 1 – L2 T3 CONT LK-I Alt 2 – L2 T3 CONT LK-E Alt 3 – L2 T3 CONT LK-L Alt 1 – L2 T3 CONT LK-LCCI (FT Gates)	As explained in Low Pressure CET description.
T3 SPR	SAHRS sprays actuated to control source term	Alt 1 - L2-T3 SAHRS SPR ST Alt 3 - L2 T3 SAHRS SP-CI L (Fault tree top gates) All alternatives use boundary condition L2 IE+5-25H	These fault trees represent failure of the sprays for source term mitigation (including operator failures that are different). Alt 1 event is used for all release categories except RC 200s following a loss of containment isolation. Alt 2 is used for operator actions following failure of containment isolation in high pressure scenarios.

Table 19C-9—Containment Event Tree #CET LO PRESSURE(E) - CET for Low Pressure(E) CDES or Depressurized HI CDES

Event-Tree Top Event		Input Events	Description of input events
CET LO PRESSURE(E)	ENTRY: Low pressure (E) CDES or Depressurized HI CDES	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
CET LO PRESS LABEL	Label sequences for CET LO PRESS	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
T2 CFIVSE	No containment fail due to in-vessel steam explosion	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
T2 PFIVSE	No reactor pit damage due to lower head failure by in-vessel steam explosion	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
T2 VB	Melt retention in-vessel	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
T2 PFXVSE	Reactor Pit not damaged by ex-vessel steam explosion or (for hi press seqs) pit overpressure at VF	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
T2 CF	No containment failure at the time of Vessel Breach	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
T3 MSXV	Melt stabilization ex-vessel	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE
T3 SPR	SAHRS sprays actuated to control source term	Similar to #CET LO PRESSURE	Similar to CET LO PRESSURE

Table 19C-10—CDES Link Event Tree for CDES AT (Event Tree ID - CDES-AT)

Event-Tree Top Event		Input Events	Description of input events
CDES AT	Transfer from core damage end state AT	AT (consequence)	Consequence AT representing CDES AT end state of Level 1 core damage event trees.
CDES-LABEL-AT	Label CDES AT	L2FLCDES-AT (Basic event) Boundary condition BCS L2FLCDES-AT	Flag used to mark sequences as coming from CDES AT prior to transfer to CET1 HI PRESSURE.

Table 19C-11—CDES Link Event Tree for CDES ATI (Event Tree ID - CDES-ATI)

Event-Tree Top Event		Input Events	Description of Input Events
CDES ATI	Transfer from core damage end state ATI	ATI (consequence) Boundary condition BCS LOAD SHED	Consequence ATI representing CDES ATI end state of Level 1 core damage event trees.
SAHR SPRY	Sprays for pressure control in containment following SLBI	SAHR SPRAY SLBI (Gate)	Top event representing availability of SAHRS sprays for pressure control in containment. The failure path of this top event is led to CET CF for a guaranteed containment failure.
OP SAHR SLBI-1	Operator starts SAHR Spray before 5 hours	OPE-L2SAHRSP-SLB-5H (Basic event)	Operator action to start the SAHRS sprays for pressure control in containment following SLBI initiator. The time frame of 5 hours is based on a negligible mean containment failure probability (L2PH CONT SLBI-5H in the order of 5E-5). If the operator action is successful the sequence is assigned a containment failure probability corresponding to the containment pressurization over 5 hours (this is done in top event CONT INTACT described below). The failure path is further analyzed by testing for a recovery action.
OP SAHR SLBI-2	Operator starts SAHR Spray before between 5 and 9 hours	OPE-L2SAHRSP-SLB-9H (Basic event)	This top event evaluates the failure path of the first operator action to start the SAHRS sprays. The time frame taken for the recovery action is between 5 and 9 hours; after 9 hours the containment failure probability is taken as 1. The failure path of the top event is led to CET CF for a guaranteed containment failure.
CONT INTACT	Containment Intact after SLBI	Alt1 - L2PH CONT SLBI-5H Alt2 - L2PH CONT SLBI-9H (Basic events)	This top event assigns containment failure probabilities with: <ul style="list-style-type: none"> Alt 1 used if the initial operator action is successful (the success path of Alt 1 leads to CDES TRD and the failure path leads to CET CF). Alt 2 used if the recovery action is successful (the success path of Alt 2 leads to CDES TRD and the failure path leads to CET CF).

Table 19C-12—CDES Link Event Tree for CDES ATI1 (Event Tree ID - CDES-ATI1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES ATI	Transfer from core damage end state ATI1	ATI (consequence) Boundary condition BCS LOAD SHED	As described in CDES-ATI.
SAHR SPRY	Sprays for pressure control in containment following SLBI	SAHR SPRAY SLBI (Gate)	As described in CDES-ATI.
OP SAHR SLBI-1	Operator starts SAHR Spray before 5 hours	OPE-L2SAHRSP-SLB-5H (Basic event)	As described in CDES-ATI.
OP SAHR SLBI-2	Operator starts SAHR Spray before between 5 and 9 hours	OPE-L2SAHRSP-SLB-9H (Basic event)	As described in CDES-ATI.
CONT INTACT	Containment Intact after SLBI	Alt1 - L2PH CONT SLBI-5H Alt2 - L2PH CONT SLBI-9H (Basic events)	This top event assigns containment failure probabilities with: <ul style="list-style-type: none"> • Alt 1 used if the initial operator action is successful (the success path of Alt 1 leads to CDES TR1D and the failure path leads to CET CF). • Alt 2 used if the recovery action is successful (the success path of Alt 2 leads to CDES TR1D and the failure path leads to CET CF).

Table 19C-13—CDES Link Event Tree for CDES IS (Event Tree ID - CDES-IS)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-IS	Entry from IS CDES	IS (consequence)	Consequence IS representing CDES IS end state of Level 1 core damage event trees.
CDES-LABEL-IS	Label CDES IS	L2FLCDES-IS (Basic event) Boundary condition BCS L2FLCDES-IS	Flag used to mark sequences as coming from CDES IS prior to transfer to CET-ISL.

Table 19C-14—CDES Link Event Tree for CDES LL (Event Tree ID - CDES-LL)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-LL	Entry from LL CDES	LL (consequence)	Consequence LL representing CDES LL end state of Level 1 core damage event trees.
CDES-LABEL-LL	Label CDES LL	Alt 1- L2FLCDES-LL with boundary condition BCS L2FLCDES-LL Alt 2- L2FLCDES-LL(CA) with boundary condition BCS L2FLCDES-LL(CA) Alt 3- L2FLCDES-LL(CB) with boundary condition BCS L2FLCDES-LL(CB) Alt 4- L2FLCDES-LL(D) with boundary condition BCS L2FLCDES-LL(D) Alt 5- L2FLCDES-LL(E) with boundary condition BCS L2FLCDES-LL(E) (Gates)	Flag used to mark sequences as coming from CDES LL prior to transfer to CET LO PRESSURE. Alt 2 through 5 are used in shutdown. The input gates to all alternatives use an AND gate between the plant operating state house event (Power or shutdown POSs) and the flag basic events.

Table 19C-15—CDES Link Event Tree for CDES LL1 (Event Tree ID - CDES-LL1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-LL1	Entry from CDES LL1	LL1 (consequence)	Consequence LL1 representing CDES LL1 end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes. The success path is sent to CET LIMITED CD and the failure path is sent to CET LO PRESSURE.
CDES-LABEL-LL1	Label CDES LL1	Alt 1- L2FLCDES-LL with boundary condition BCS L2FLCDES-LL Alt 2- L2FLCDES-LL(CA) with boundary condition BCS L2FLCDES-LL(CA) Alt 3- L2FLCDES-LL(CB) with boundary condition BCS L2FLCDES-LL(CB) Alt 4- L2FLCDES-LL(D) with boundary condition BCS L2FLCDES-LL(D) Alt 5- L2FLCDES-LL(E) with boundary condition (Gate)	Flag used to mark sequences as coming from CDES LL1 prior to transfer to CET LIMITED CD or CET LO PRESSURE. Alt 2 through 5 are used in shutdown. The input gates to all alternatives use an AND gate between the plant operating state house event (Power or shutdown POSs) and the flag basic events.

Table 19C-16—CDES Link Event Tree for CDES ML (Event Tree ID - CDES-ML)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-ML	Entry from ML CDES	ML (consequence)	Consequence ML representing CDES ML end state of Level 1 core damage event trees.
CDES-LABEL-ML	Label CDES ML	L2FLCDES-ML with boundary condition BCS L2FLCDES-ML (basic event)	Flag used to mark sequences as coming from CDES ML prior to transfer to CET LO PRESSURE.

Table 19C-17—CDES Link Event Tree for CDES ML1 (Event Tree ID - CDES-ML1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-ML1	Entry from ML CDES	ML1 (consequence) Boundary condition BCS LOAD SHED	Consequence ML1 representing CDES ML1 end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes. The failure path leads to CET LO PRESSURE.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open of 1 out of 3 PSRVs and failure to open of both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heat up for cases with availability of LHSI and opening of one primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The failure path leads to CET LO PRESSURE. The success path leads to CET LIMITED CD.
CDES-LABEL-ML1	Label CDES ML1	L2FLCDES-ML with boundary condition BCS L2FLCDES-ML (basic event)	Flag used to mark sequences as coming from CDES ML prior to transfer to CET LO PRESSURE.

Table 19C-18—CDES Link Event Tree for CDES PL (Event Tree ID - CDES-PL)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-PL	Entry from PL CDES	PL (consequence)	Consequence PL representing CDES PL end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes. Success implies limited core damage. The success path at power leads to CET LIMITED CD and the failure path to CET LO PRESSURE.
CDES-LABEL-PL	Label CDES PL	Alt1 - L2F CDES PL boundary condition BCS L2FLCDES-PL Alt2 - L2F CDES PL(CA) boundary condition BCS L2FLCDES-PL(CA) Alt3 - L2F CDES PL(CB) boundary condition BCS L2FLCDES-PL(CB) (Gates)	Flag used to mark sequences as coming from CDES PL prior to transfer to CET LO PRESSURE or CET LIMITED CD. Note that Alt 2 and Alt 3 are used in shutdown POSs CA and CB respectively.

Table 19C-19—CDES Link Event Tree for CDES RV (Event Tree ID - CDES-RV)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-RV	Label as RV	RV (consequence)	Consequence RV representing CDES RV end state of Level 1 core damage event trees.
CDES-LABEL-RV	Label CDES RV	L2FLCDES-RV with boundary condition BCS L2FLCDES-RV (Basic event)	Flag used to mark sequences as coming from CDES RV prior to transfer to CET LO PRESSURE.

Table 19C-20—CDES Link Event Tree for CDES SG (Event Tree ID - CDES-SG)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SG	Entry from CDES SG	SG (consequence)	Consequence SG representing CDES SG end state of Level 1 core damage event trees.
L2 FW RUP SG	FW to ruptured SG	L2 SYS FW RUP SG (Gate)	Identifies whether or not the SGTR is expected to be covered by water (operator restart of feed water to the affected SG). The fault tree transfers to EFWS train 4 (which corresponds to the assumed location of the SGTR in Level 1). The failure path leads to CET SGTR while the success path leads to CET SGTR FW.
CDES-LABEL-SG	Label CDES SG	L2FLCDES-SG with boundary condition BCS L2FLCDES-SG (Basic event)	Flag used to mark sequences as coming from CDES SG prior to transfer to CET.

Table 19C-21—CDES Link Event Tree for CDES SG1 (Event Tree ID - CDES-SG1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SG1	Entry from CDES SG1	SG1 (consequence)	Consequence SG1 representing CDES SG1 end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open of 1 out of 3 PSRVs and failure to open of both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage.
L2 FW RUP SG	FW to ruptured SG	L2 SYS FW RUP SG (Gate)	Identifies whether or not the SGTR is expected to be covered by water (operator restart of feed water to the affected SG). The fault tree transfers to EFWS train 4 (which corresponds to the assumed location of the SGTR in Level 1). Success of this top event leads to CET SGTR FW and failure leads to CET SGTR.
CDES-LABEL-SG1	Label CDES SG1	L2FLCDES-SG with boundary condition BCS L2FLCDES-SG (Basic event)	Flag used to mark sequences as coming from CDES SG1 prior to transfer to CET.

Table 19C-22—CDES Link Event Tree for CDES SL (Event Tree ID - CDES-SL)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SL	Entry from SL CDES	SL (consequence)	Consequence SL representing CDES SL end state of Level 1 core damage event trees.
CDES-LABEL-SL	Label CDES SL	Alt1 - L2F CDES SL boundary condition BCS L2FLCDES-SL Alt2 - L2F CDES SL(CA) boundary condition BCS L2FLCDES-SL(CA) Alt3 - L2F CDES SL(CB) boundary condition BCS L2FLCDES-SL(CB) Alt4 - L2F CDES SL(D) boundary condition BCS L2FLCDES-SL(D) Alt5 - L2F CDES SL(E) boundary condition BCS L2FLCDES-SL(CE) (Gates)	Flag used to mark sequences as coming from CDES SL prior to transfer to CET HI PRESSURE (At power, and shutdown POS CA and CB) and CET LO PRESSURE for POS D and E. Note that Alt 2 through Alt 5 are used in shutdown POSs.

Table 19C-23—CDES Link Event Tree for CDES SL1 (Event Tree ID - CDES-SL1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SL1	Entry from SL1 CDES	SL1 (consequence) Boundary condition BCS LOAD SHED	Consequence SL1 representing CDES SL1 end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open of 1 out of 3 PSRVs and failure to open of both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage (CET LIMITED CD) failure path.
CDES- LABEL- SL1	Label CDES SL1	L2FLCDES-SL with boundary condition BCS L2FLCDES-SL (basic event)	Flag used to mark sequences as coming from CDES SL prior to transfer to CET LIMITED CD or CET1 HI PRESSURE.

Table 19C-24—CDES Link Event Tree for CDES SL1D (Event Tree ID - CDES-SL1D)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SL1D	Entry from SL1D CDES	SL1D (consequence) Boundary condition BCS LOAD SHED	Consequence SL1D representing CDES SL1D end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open 1 out of 3 PSRVs and failure to open both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESURE.
CDES-LABEL-SL1D	Label as SL1D	L2FLCDES-SLD with boundary condition BCS L2FLCDES-SLD (basic event)	Flag used to mark sequences as coming from CDES SLD prior to transfer to CET LIMITED CD or CET1 HI PRESURE.

Table 19C-25—CDES Link Event Tree for CDES SLD (Event Tree ID - CDES-SLD)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SLD	Entry from SLD CDES	SLD (consequence)	Consequence SLD representing CDES SLD end state of Level 1 core damage event trees.
CDES-LABEL-SLD	Label as SLD	L2FLCDES-SLD with boundary condition BCS L2FLCDES-SLD (basic event)	Flag used to mark sequences as coming from CDES SLD prior to transfer to CET1 HI PRESSURE.

Table 19C-26—CDES Link Event Tree for CDES SP (Event Tree ID - CDES-SP)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SP	Entry from SP CDES	SP (consequence)	Consequence SP representing CDES SP end state of Level 1 core damage event trees.
CDES-LABEL-SP	Label CDES SP	L2FLCDES-SP with boundary condition BCS L2FLCDES-SP (basic event)	Flag used to mark sequences as coming from CDES SP prior to transfer to CET1 HI PRESSURE.

Table 19C-27—CDES Link Event Tree for CDES SP1 (Event Tree ID - CDES-SP1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SP1	Entry from CDES SP1	SP1 (consequence) Boundary condition BCS LOAD SHED	Consequence SP1 representing CDES SP1 end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open of 1 out of 3 PSRVs and failure to open of both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESSURE.
CDES-LABEL-SP1	Label CDES SP1	L2FLCDES-SP with boundary condition BCS L2FLCDES-SP (basic event)	Flag used to mark sequences as coming from CDES SP prior to transfer to CET LIMITED CD or CET1 HI PRESSURE.

Table 19C-28—CDES Link Event Tree for CDES SP1D (Event Tree ID - CDES-SP1D)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SP1D	Entry from CDES SP1D	SP1D (consequence) Boundary condition BCS LOAD SHED.	Consequence SP1D representing CDES SP1D end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open 1 out of 3 PSRVs and failure to open both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESSURE.
CDES-LABEL-SP1D	Label CDES SP1D	L2FLCDES-SPD with boundary condition BCS L2FLCDES-SPD (basic event)	Flag used to mark sequences as coming from CDES SPD prior to transfer to CET CET LIMITED CD or CET1 HI PRESSURE.

Table 19C-29—CDES Link Event Tree for CDES SPD (Event Tree ID - CDES-SPD)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SPD	Entry from CDES SPD	SPD (consequence)	Consequence SPD representing CDES SPD end state of Level 1 core damage event trees.
CDES-LABEL-SPD	Label CDES SPD	L2FLCDES-SPD with boundary condition BCS L2FLCDES-SPD (basic event)	Flag used to mark sequences as coming from CDES SPD prior to transfer to CET HI PRESSURE.

Table 19C-30—CDES Link Event Tree for CDES SS (Event Tree ID - CDES-SS)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SS	Entry from SS CDES	SS (consequence)	Consequence SS representing CDES SS end state of Level 1 core damage event trees.
ISL FLD-SIS	CDES from IE SIS-FLD leads to ISLOCA	Alt 1 - ISL FLD-SIS=N Alt 2 - ISL FLD-SIS=Y (Gates)	Alt1 selects all sequences with initiators other than flood SIS (IE FLD-SIS) and Alt2 selects sequences with IE FLD-SIS. This modeling is used because IE FLD-SIS transfers to LOCCW tree in the Level 1 as well as many other initiators. For all initiators except IE FLD-SIS the CDES used in the LOCCW tree are the same (SS, SS1, SSD, SS1D, TR or TRD). However for IE FLD-SIS the appropriate CDES should be IS, as this initiator creates an SIS flood outside containment. Using the link tree to assign CDES IS to the appropriate sequences was considered the most efficient way to keep the number of event trees limited.
CDES-LABEL-SS	Label CDES SS	Alt1 - L2F CDES SS boundary condition BCS L2FLCDES-SS Alt2 - L2F CDES SS(CA) boundary condition BCS L2FLCDES-SS(CA) Alt3 - L2F CDES SL(CB) boundary condition BCS L2FLCDES-SL(CB) (Gates)	Flag used to mark sequences as coming from CDES SS prior to transfer to CET HI PRESSURE (At power). The label is only assigned to sequences without IE FLD-SIS. Note that Alt 2 and Alt 3 are used in shutdown POSs.

Table 19C-31—CDES Link Event Tree for CDES SS1 (Event Tree ID - CDES-SS1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SS1	Entry from SS1 CDES	SS1 (consequence) Boundary condition BCS LOAD SHED	Consequence SS1 representing CDES SS1 end state of Level 1 core damage event trees.
ISL FLD-SIS	CDES from IE SIS-FLD leads to ISLOCA	Alt 1 - ISL FLD-SIS=N Alt 2 - ISL FLD-SIS=N (Gates)	Alt1 selects all sequences with initiators other than flood SIS (IE FLD-SIS) and Alt2 selects sequences with IE FLD-SIS. This modeling is used because IE FLD-SIS transfers to LOCCW tree in the Level 1 as well as many other initiators. For all initiators except IE FLD-SIS the CDES used in the LOCCW tree are the same (SS, SS1, SSD, SS1D, TR or TRD). However for IE FLD-SIS the appropriate CDES should be IS, as this initiator creates an SIS flood outside containment. Using the link tree to assign CDES IS to the appropriate sequences was considered the most efficient way to keep the number of event trees limited.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open of 1 out of 3 PSRVs and failure to open both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESSURE.
CDES-LABEL-SS1	Label CDES SS1	L2F CDES SS boundary condition BCS L2FLCDES-SS	Flag used to mark sequences as coming from CDES SS1 prior to transfer to CET HI PRESSURE or CET LIMITED CD. The label is only assigned to sequences without IE FLD-SIS.

Table 19C-32—CDES Link Event Tree for CDES SS1D (Event Tree ID - CDES-SS1D)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SS1D	Entry from SS1D CDES	SS1D (consequence) Boundary condition BCS LOAD SHED	Consequence SS1D representing CDES SS1D end state of Level 1 core damage event trees.
ISL FLD-SIS	CDES from IE SIS-FLD leads to ISLOCA	Alt 1 - ISL FLD-SIS=N Alt 2 - ISL FLD-SIS=N (Gates)	Alt1 selects all sequences with initiators other than flood SIS (IE FLD-SIS) and Alt2 selects sequences with IE FLD-SIS. This modeling is used because IE FLD-SIS transfers to LOCCW tree in the Level 1 as well as many other initiators. For all initiators except IE FLD-SIS the CDES used in the LOCCW tree are the same (SS, SS1, SSD, SS1D, TR or TRD). However for IE FLD-SIS the appropriate CDES should be IS, as this initiator creates an SIS flood outside containment. Using the link tree to assign CDES IS to the appropriate sequences was considered the most efficient way to keep the number of event trees limited.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open of 1 out of 3 PSRVs and failure to open both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESSURE.
CDES-LABEL-SS1D	Label CDES SS1D	L2F CDES SSD boundary condition BCS L2FLCDES-SSD	Flag used to mark sequences as coming from CDES SSD prior to transfer to CET HI PRESSURE. The label is only assigned to sequences without IE FLD-SIS.

Table 19C-33—CDES Link Event Tree for CDES SSD (Event Tree ID - CDES-SSD)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-SSD	Entry from SSD CDES	SSD (consequence)	Consequence SSD representing CDES SSD end state of Level 1 core damage event trees.
ISL FLD-SIS	CDES from IE SIS-FLD leads to ISLOCA	Alt 1 - ISL FLD-SIS=N Alt 2 - ISL FLD-SIS=N (Gates)	Alt1 selects all sequences with initiators other than flood SIS (IE FLD-SIS) and Alt2 selects sequences with IE FLD-SIS. This modeling is used because IE FLD-SIS transfers to LOCCW tree in the Level 1 as well as many other initiators. For all initiators except IE FLD-SIS the CDES used in the LOCCW tree are the same (SS, SS1, SSD, SS1D, TR or TRD). However for IE FLD-SIS the appropriate CDES should be IS, as this initiator creates an SIS flood outside containment. Using the link tree to assign CDES IS to the appropriate sequences was considered the most efficient way to keep the number of event trees limited.
CDES-LABEL-SSD	Label CDES SSD	L2F CDES SSD boundary condition BCS L2FLCDES-SSD	Flag used to mark sequences as coming from CDES SSD prior to transfer to CET HI PRESSURE. The label is only assigned to sequences without IE FLD-SIS.

Table 19C-34—CDES Link Event Tree for CDES TP (Event Tree ID - CDES-TP)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-TP	Entry from TP CDES	TP (consequence)	Consequence TP representing CDES TP end state of Level 1 core damage event trees.
CDES-LABEL-TP	Label CDES TP	L2F CDES-TP boundary condition BCS L2FLCDES-TP	Flag used to mark sequences as coming from CDES TP prior to transfer to CET HI PRESSURE.

Table 19C-35—CDES Link Event Tree for CDES TP1 (Event Tree ID - CDES-TP1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-TP1	Entry from CDES TP1	TP1 (consequence) Boundary condition BCS LOAD SHED	Consequence TP1 representing CDES TP1 end state of Level 1 core damage event trees.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Fault tree top gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open of 1 out of 3 PSRVs and failure to open of both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESSURE.
CDES-LABEL-TP1	Label CDES TP1	L2F CDES-TP boundary condition BCS L2FLCDES-TP	Flag used to mark sequences as coming from CDES TP prior to transfer to CET HI PRESSURE.

Table 19C-36—CDES Link Event Tree for CDES TR (Event Tree ID - CDES-TR)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-TR	Entry from CDES TR	TR (consequence)	Consequence TR representing CDES TR end state of Level 1 core damage event trees.
ISL FLD-SIS	CDES from IE SIS-FLD leads to ISLOCA	Alt 1 - ISL FLD-SIS=N Alt 2 - ISL FLD-SIS=Y (Gates)	Alt1 selects all sequences with initiators other than flood SIS (IE FLD-SIS) and Alt2 selects sequences with IE FLD-SIS. This modeling is used because IE FLD-SIS transfers to LOCCW tree in the Level 1 as well as many other initiators. For all initiators except IE FLD-SIS the CDES used in the LOCCW tree are the same (SS, SS1, SSD, SS1D, TR or TRD). However for IE FLD-SIS the appropriate CDES should be IS, as this initiator creates an SIS flood outside containment. Using the link tree to assign CDES IS to the appropriate sequences was considered the most efficient way to keep the number of event trees limited.
CDES-LABEL-TR	Label CDES TR	Alt1 - L2F CDES TR boundary condition BCS L2FLCDES-TR Alt2 - L2F CDES TR(C) boundary condition BCS L2FLCDES-TR(C) Alt3 - L2F CDES TR(D) boundary condition BCS L2FLCDES-TR(D) (Gates)	Flag used to mark sequences as coming from CDES TR prior to transfer to CET HI PRESSURE (At power). The label is only assigned to sequences without IE FLD-SIS. Note that Alt 2 and Alt 3 are used in shutdown POSs.

Table 19C-37—CDES Link Event Tree for CDES TR1 (Event Tree ID - CDES-TR1)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-TR1	Entry from CDES TR1	TR1 (consequence) Boundary condition BCS LOAD SHED	Consequence TR1 representing CDES TR1 end state of Level 1 core damage event trees.
ISL FLD-SIS	CDES from IE SIS-FLD leads to ISLOCA	Alt 1 - ISL FLD-SIS=N Alt 2 - ISL FLD-SIS=Y (Gates)	Alt1 selects all sequences with initiators other than flood SIS (IE FLD-SIS) and Alt2 selects sequences with IE FLD-SIS. This modeling is used because IE FLD-SIS transfers to LOCCW tree in the Level 1 as well as many other initiators. For all initiators except IE FLD-SIS the CDES used in the LOCCW tree are the same (SS, SS1, SSD, SS1D, TR or TRD). However for IE FLD-SIS the appropriate CDES should be IS, as this initiator creates an SIS flood outside containment. Using the link tree to assign CDES IS to the appropriate sequences was considered the most efficient way to keep the number of event trees limited.
L2 PSV	PSV opening for F&B - L2 success criteria	GL2 SYS PSV-1 (Fault tree top gate)	The fault tree transfers to PBL01 which models only the failure to open 1 out of 3 PSRVs and failure to open both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESSURE.
L2 LHSI	LHSI Injection and long term heat removal available	GL2 SYS SI-1 (Fault tree top gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
CDES-LABEL-TR1	Label CDES TR1	L2F CDES-TR boundary condition BCS L2FLCDES-TR (basic event)	Flag used to mark sequences as coming from CDES TR prior to transfer to CET HI PRESSURE. The label is only assigned to sequences without IE FLD-SIS.

Table 19C-38—CDES Link Event Tree for CDES TR1D (Event Tree ID - CDES-TR1D)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-TR1D	Entry from CDES TR1D	TR1D (consequence) Boundary condition BCS LOAD SHED	Consequence TR1D representing CDES TR1D end state of Level 1 core damage event trees.
L2 PSV	PSV opening for F&B - L2 success criteria	L2 SYS PSV (Gate)	The fault tree transfers to PBL01 which models only the failure to open 1 out of 3 PSRVs and failure to open both Primary Depressurization System trains (no secondary steam relief is required). This is justified as a success criteria for limited core damage by reference to MAAP runs performed in support of the Level 2 PRA which show very limited core heatup for cases with availability of LHSI and opening of 1 primary depressurization system valve at 650 degrees C core outlet (later than the assumed opening time for F&B). The success path of this top event and the previous lead to limited core damage CET LIMITED CD the failure path leads to CET1 HI PRESSURE.
L2 LHSI	LHSI Injection and long term heat removal available	L2 LHSI (Gate)	No safety injection available for Level 2 in-vessel recovery. This fault tree transfers to the gate used in Level 1 for LHSI CHR 4/4 - which models the failure of 4 LHSI trains to operate in injection and heat removal modes.
CDES- LABEL- TR1D	Label CDES TR1D	L2FLCDES-TRD boundary condition BCS L2FLCDES-TRD (basic event)	Flag used to mark sequences as coming from CDES TRD prior to transfer to CET HI PRESSURE.

Table 19C-39—CDES Link Event Tree for CDES TRD (Event Tree ID - CDES-TRD)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-TRANN	Entry from CDES TRANN	TRANN (consequence)	Consequence TRANN representing CDES TRANN end state of Level 1 core damage event trees from flood in annulus.
CDES-LABEL-TRD	Label CDES TRD	L2FLCDES-TRANN boundary condition BCS L2FLCDES-TRANN (basic event)	Flag used to mark sequences as coming from CDES TRANN prior to transfer to CET1 HI PRESSURE.

Table 19C-40—CDES Link Event Tree for CDES TRANN (Event Tree ID - CDES-TRANN)

Event-Tree Top Event		Input Events	Description of Input Events
CDES-TRANN	Entry from CDES TRANN	TRANN (consequence)	Consequence TRANN representing CDES TRANN end state of Level 1 core damage event trees.
CDES-LABEL-TRANN	Label CDES TRANN	L2FLCDES-TRANN boundary condition BCS L2FLCDES-TRANN (basic event)	Flag used to mark sequences as coming from CDES TRANN prior to transfer to CET HI PRESSURE.

Figure 19C-1—Containment Event Tree CET CF

Entry from CDES with containment overpressurised			
	#CET CF	#CET CF LABEL	No.
		1	
		2	RC304

REV 005
EPR6645 T2

Figure 19C-2—Containment Event Tree CET ISL

Input: from IS CDES tree	Label sequences for CET ISL	IS LOCA break location covered by water and scrubbed		
#CET ISL	#CET ISL LABEL	#IS BL	No.	Conseq.
			1	
		1	2	RC801
		2	3	RC002

REV 005
EPR6645 T2

Figure 19C-3—Containment Event Tree CET LIMITED CD

Entry: sequences identified as limited CD in CDES link trees	Label sequences for CET LIMITED CD	In-Vessel recovery	Containment isolated 1) Large 2) Small 3) CI Success		
#CET LIMITED CD	#CET LIMITED CD LABL	#T1 IVR	#T1 CI	No.	Conseq.
				1	
				2	
			3	3	RC101
			1	4	RC201
			2	5	RC206

REV 005
EPR6655 T2

Figure 19C-5—Containment Event Tree CET SGTR

Entry: from SG CDES, sequences with FW not running	Label sequences for CET SGTR		
#CET SGTR	#CET SGTR LABEL	No.	Conseq.
		1	
		2	RC702

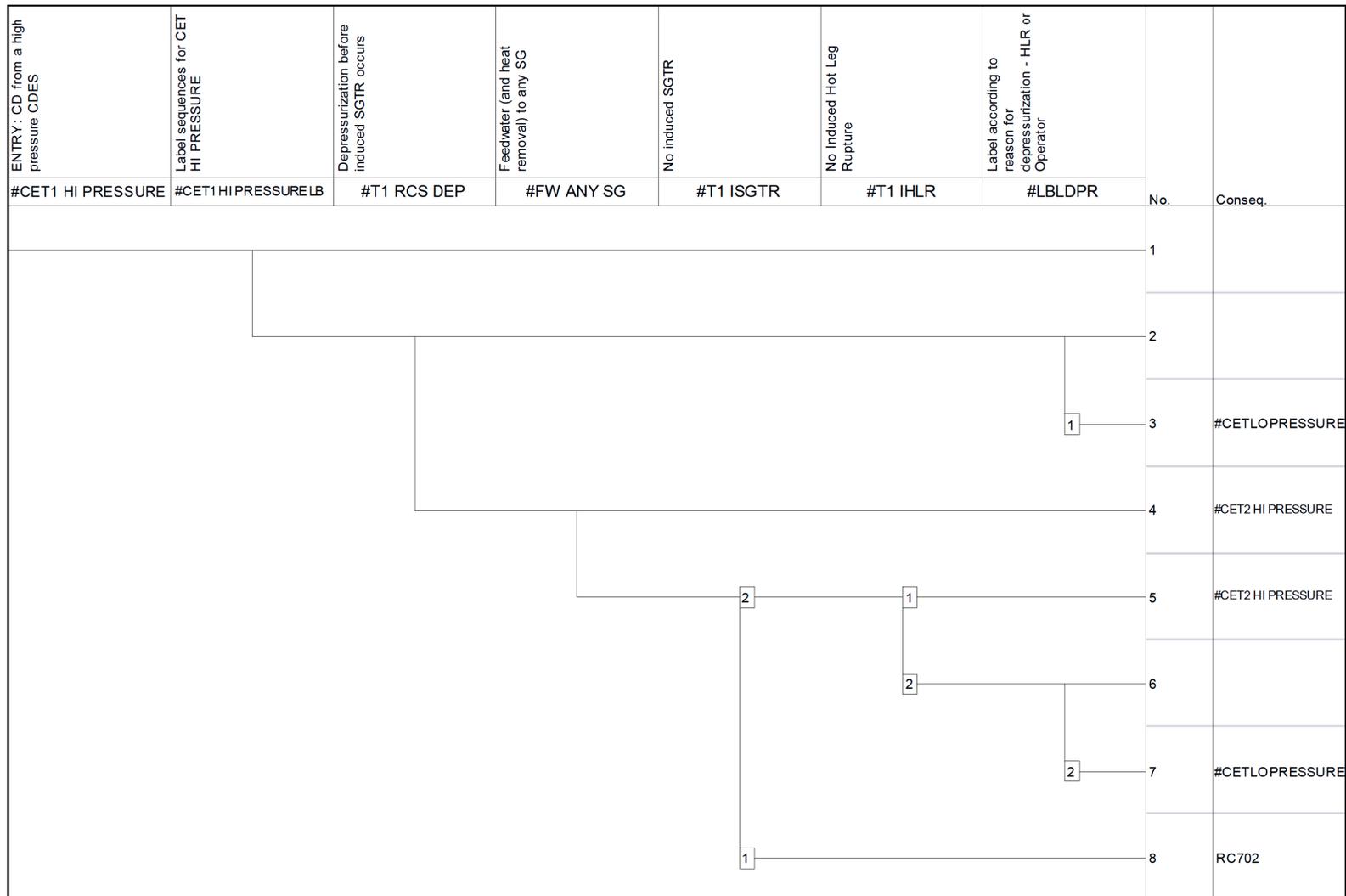
REV 005
EPR6665 T2

Figure 19C-6—Containment Event Tree CET SGTR FW

	Label sequences for CET SGTR FW		
#CET SGTR FW	#CET SGTR FW LABEL	No.	Conseq.
		1	
		2	RC701

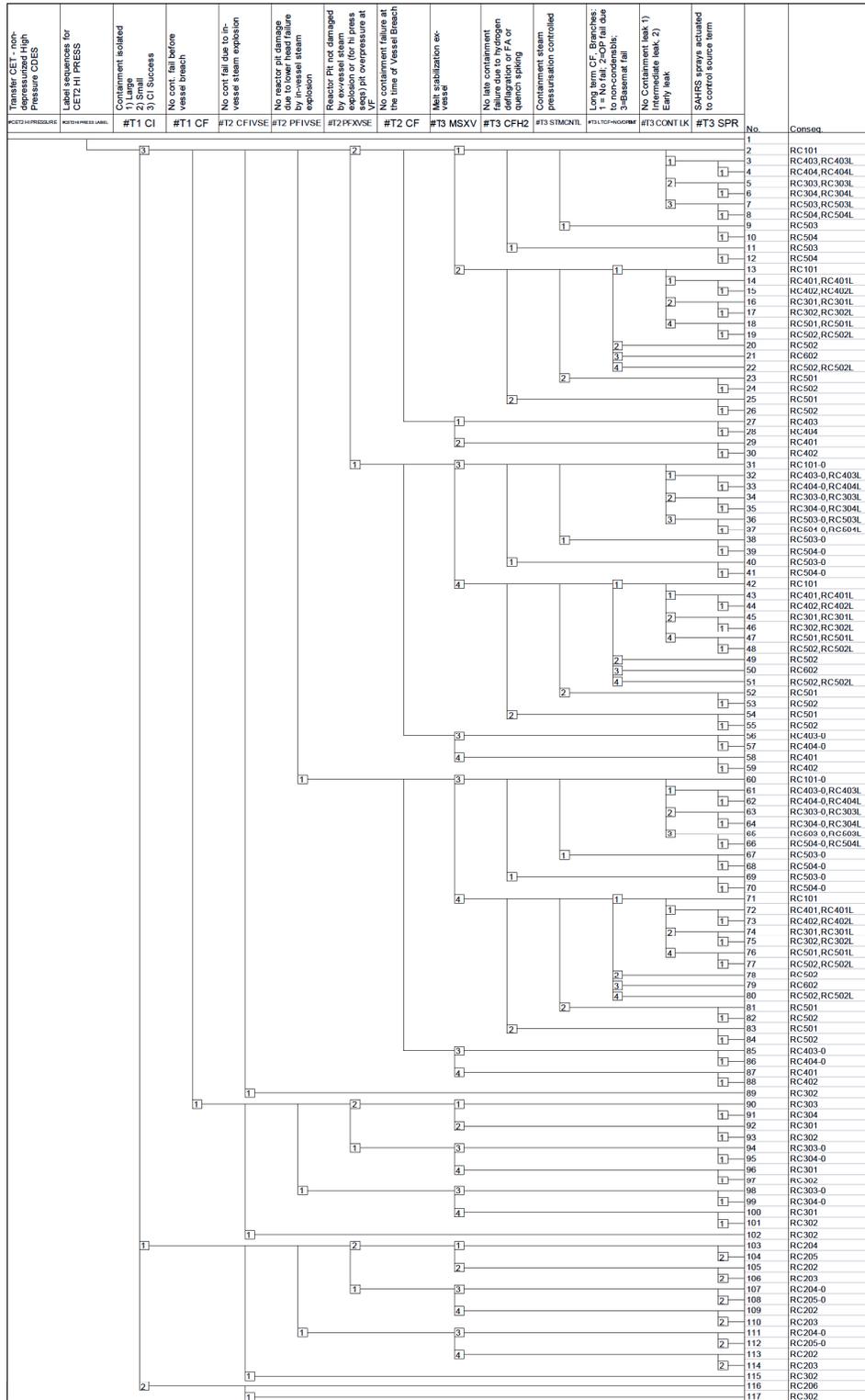
REV 005
EPR6670 T2

Figure 19C-7—Containment Event Tree CET 1 HI PRESSURE



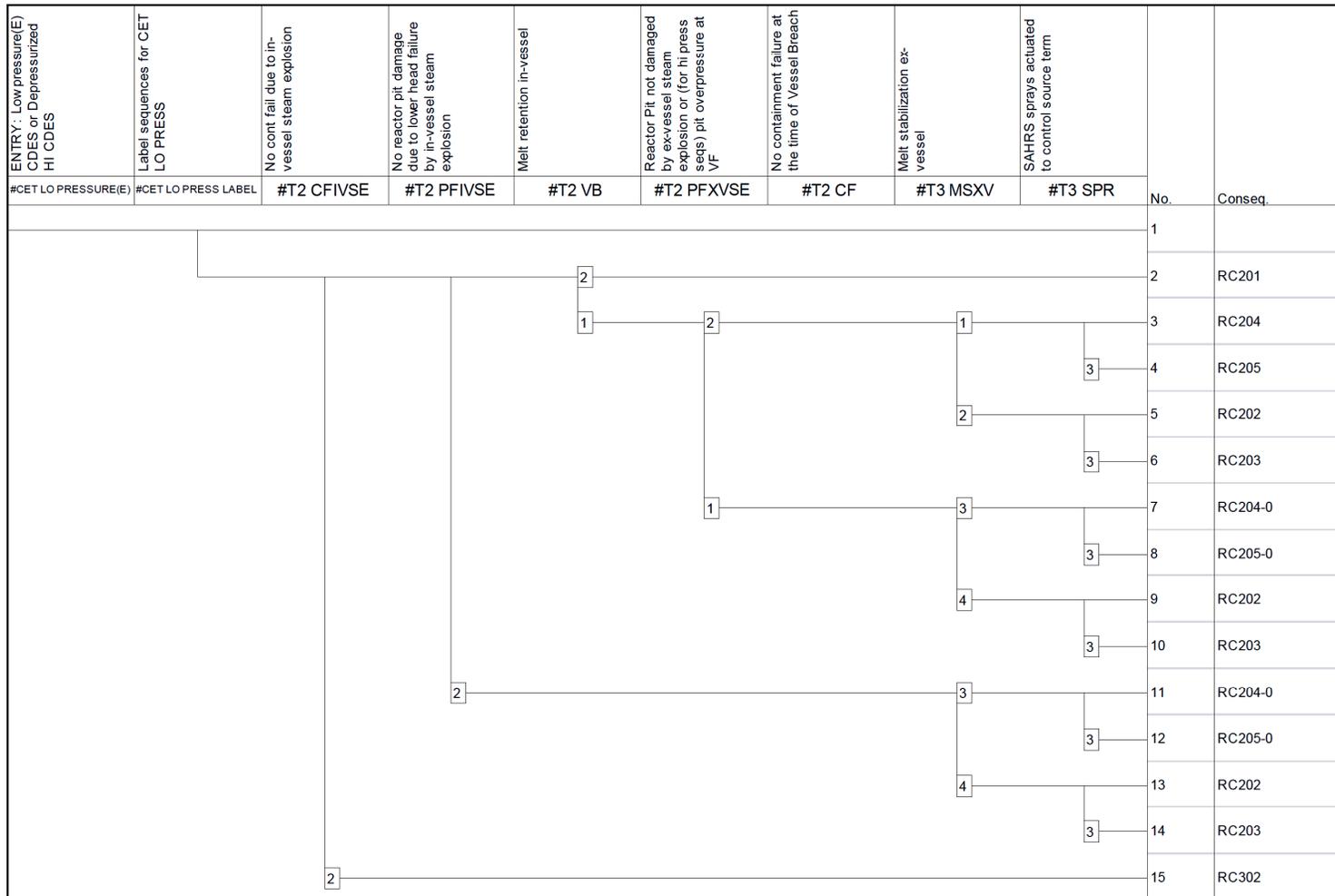
REV 005
EPR6675 T2

Figure 19C-8—Containment Event Tree CET 2 HI PRESSURE



REV 005
EPR6880 T2

Figure 19C-9—Containment Event Tree CET LO PRESSURE(E)



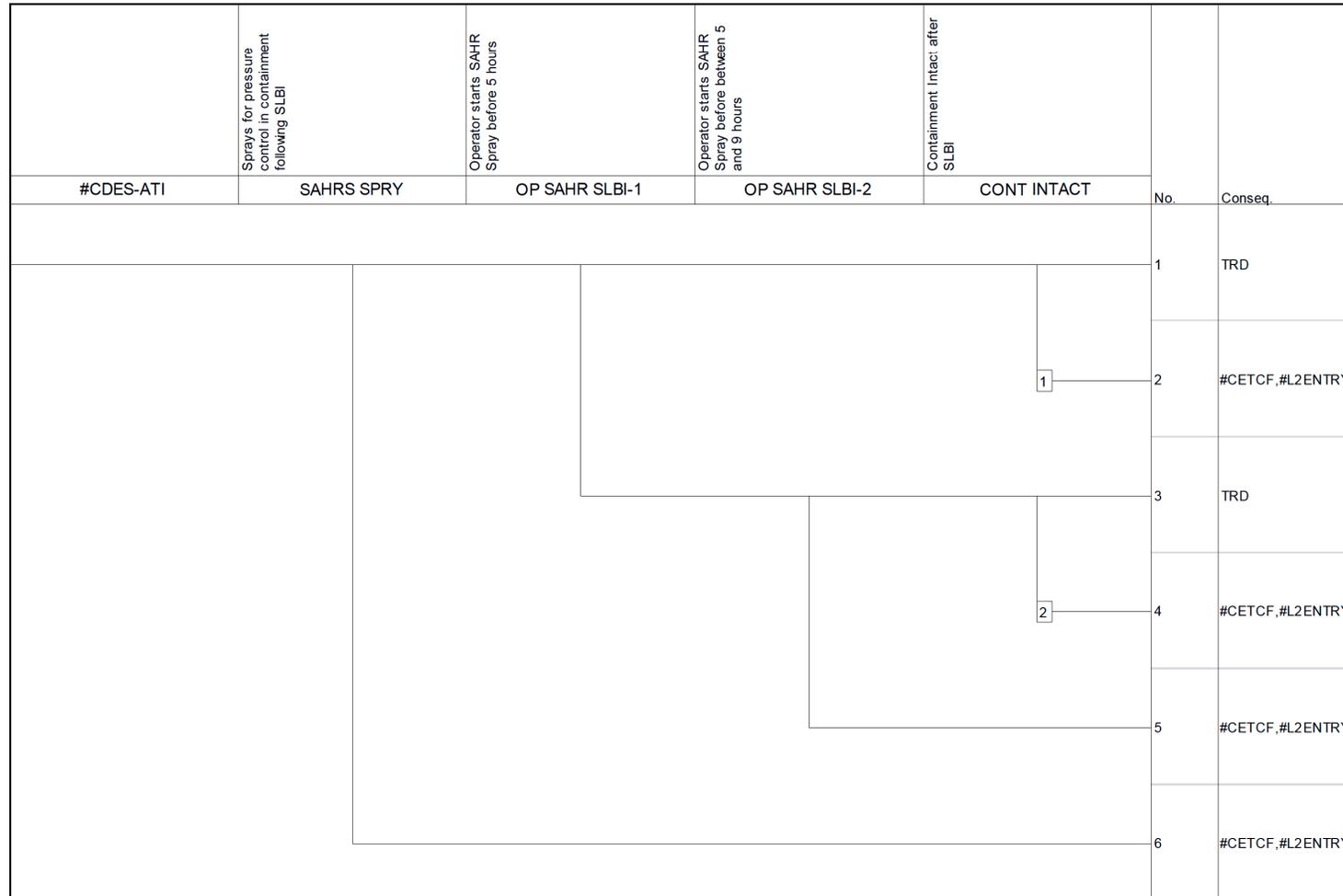
EPR6685 T2

Figure 19C-10—CDES Link Event Tree for CDES AT

#CDES-AT	#CDES-LABEL-AT	No.	Conseq.
		1	
		2	#CET1 HI PRESSURE,#L2 ENTRY

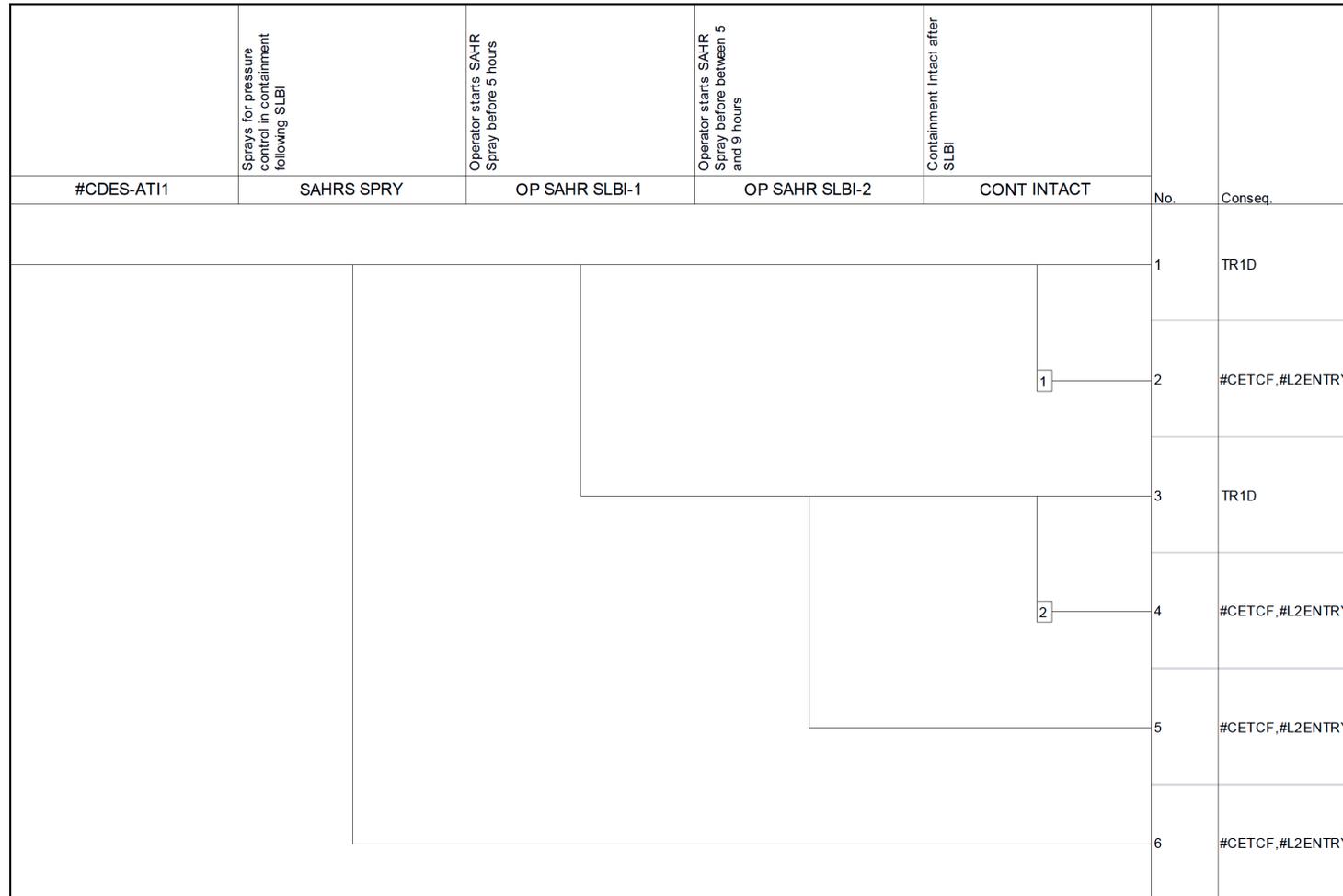
EPR6685 T2

Figure 19C-11—CDES Link Event Tree for CDES ATI



EPR6695 T2

Figure 19C-12—CDES Link Event Tree for CDES AT11



EPR6700 T2

Figure 19C-13—CDES Link Event Tree for CDES IS

Entry from IS CDES	Label CDES	No.	Conseq.
#CDES-IS	#CDES-LABEL-IS		
		1	
		2	#CET-ISL,#L2 ENTRY

EPR6705 T2

Figure 19C-14—CDES Link Event Tree for CDES LL

Entry from LL CDES	1) Power 2) S/D State CA 3) S/D State CB 4) S/D State D 5) S/D State E	#CDES-LL	#CDES-LABEL-LL	No.	Conseq.
			1	2	#CET LO PRESSURE, #L2 ENTRY
			2	3	#CETLOPRESSURE
			3	4	#CETLOPRESSURE
			4	5	#CETLOPRESSURE
			5	6	#CET LO PRESSURE(E)

EPR6710 T2

Figure 19C-15—CDES Link Event Tree for CDES LL1

Entry from CDES LL1	LHSI Injection and long term heat removal available (Power Only)	1) Power 2) S/D State CA 3) S/D State CB 4) S/D State D 5) S/D State E		
#CDES-LL1	#L2 LHSI	#CDES-LABEL-LL	No.	Conseq.
			1	
			2	#CET LIMITED CD, #L2 ENTRY
			3	
			4	#CET LO PRESSURE, #L2 ENTRY

EPR6715 T2

Figure 19C-16—CDES Link Event Tree for CDES ML

Entry from ML CDES	#CDES-ML	#CDES-LABEL-ML	No.	Conseq.
			1	
			2	#CET LO PRESSURE, #L2 ENTRY

EPR6720 T2

Figure 19C-17—CDES Link Event Tree for CDES ML1

Entry from ML1 CDES	LHSI / Injection and long term heat removal available (Power Only)	PSV opening for F&B - L2 success criteria				
#CDES-ML1	#L2 LHSI	#L2 PSV	#CDES-LABEL-ML1	No.	Conseq.	
				1		
				2	#CET LIMITED CD, #L2 ENTRY	
				3		
				4	#CET LO PRESSURE, #L2 ENTRY	
				5		
				6	#CET LO PRESSURE, #L2 ENTRY	

EPR6725 T2

Figure 19C-18—CDES Link Event Tree for CDES PL

Entry from PL CDES	#CDES-PL	#L2 LHSI	#CDES-LABEL-PL	No.	Conseq.
				1	
			1	2	#CET LIMITED CD, #L2 ENTRY
			2	3	#CET LO PRESSURE, #L2 ENTRY
			3	4	#CET LO PRESSURE, #L2 ENTRY
				5	
			1	6	#CET LO PRESSURE, #L2 ENTRY

EPR6730 T2

Figure 19C-19—CDES Link Event Tree for CDES RV

#CDES-RV	#CDES-LABEL-RV	No.	Conseq.
		1	
		2	#CET LO PRESSURE, #L2 ENTRY

EPR6735 T2

Figure 19C-20—CDES Link Event Tree for CDES SG

Entry from CDES SG	FW to ruptured SG			
#CDES-SG	#L2 FW RUP SG	#CDES-LABEL-SG	No.	Conseq.
			1	
			2	#CET SGTR FW, #L2 ENTRY
			3	
			4	#CET SGTR, #L2 ENTRY

EPR6740 T2

Figure 19C-21—CDES Link Event Tree for CDES SG1

Entry from CDES SG1	LHSI Injection and long term heat removal available (Power Only)	PSV opening for F&B - L2 success criteria	FW to ruptured SG		#CDES-SG1	#L2 LHSI	#L2 PSV	#L2 FW RUP SG	#CDES-LABEL-SG1	No.	Conseq.
										1	
										2	#CET LIMITED CO,#L2 ENTRY
										3	
										4	#CET SGTR FW,#L2 ENTRY
										5	
										6	#CET SGTR,#L2 ENTRY
										7	
										8	#CET SGTR FW,#L2 ENTRY
										9	
										10	#CET SGTR,#L2 ENTRY

EPR6745 T2

Figure 19C-22—CDES Link Event Tree for CDES SL

Entry from SL CDES	1) Power 2) S/D State CA 3) S/D State CB 4) S/D State D 5) S/D State E	#CDES-SL	#CDES-LABEL-SL	No.	Conseq.
				1	
			1	2	#CET1 HI PRESSURE,#L2 ENTRY
			2	3	#CET1 HI PRESSURE,#L2 ENTRY
			3	4	#CET1 HI PRESSURE,#L2 ENTRY
			4	5	#CET LO PRESSURE,#L2 ENTRY
			5	6	#CET LO PRESSURE(E),#L2 ENTRY

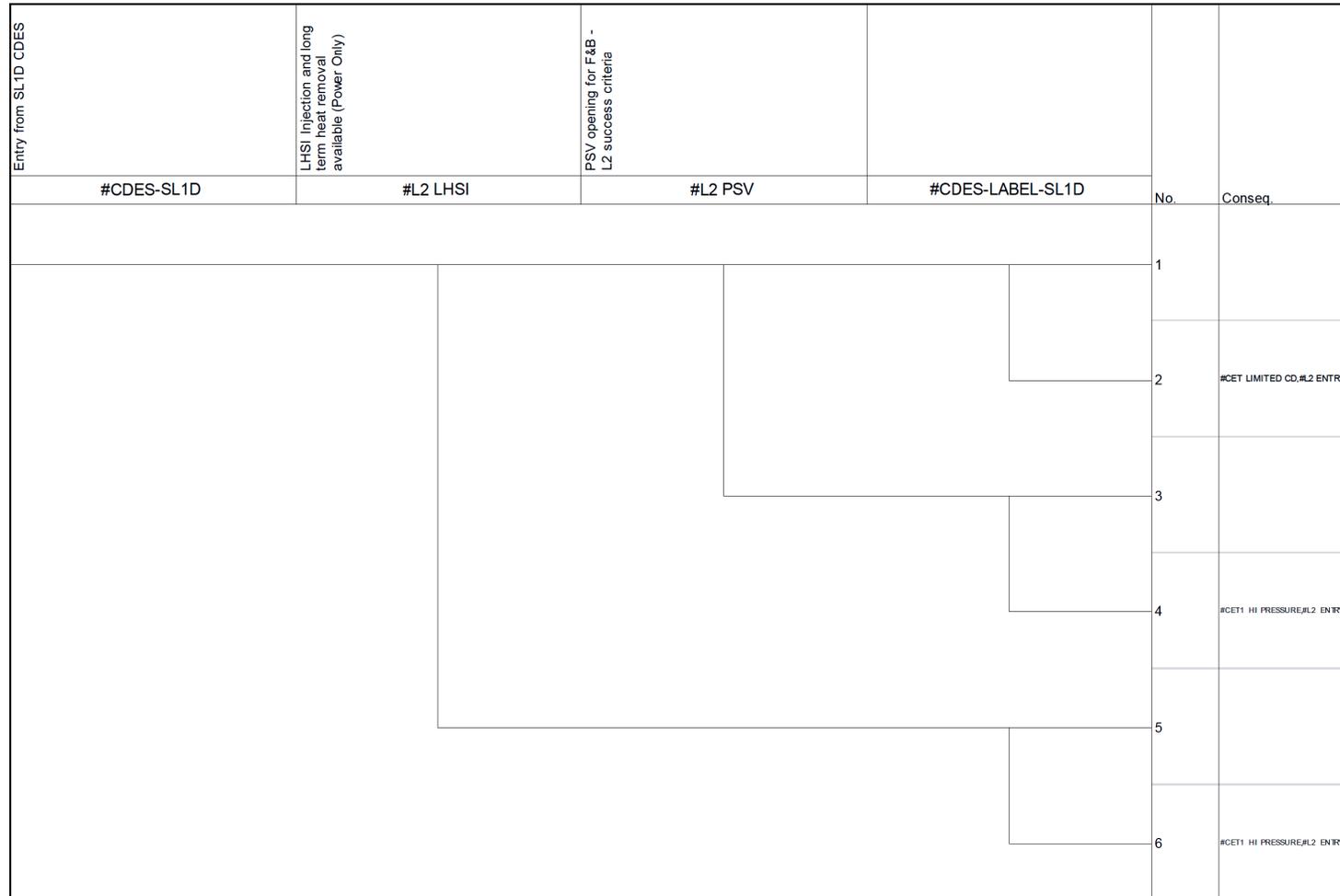
EPR6750 T2

Figure 19C-23—CDES Link Event Tree for CDES SL1

Entry from SL1 CDES	LHSI / Injection and long term heat removal available (Power Only)	PSV opening for F&B - L2 success criteria				
#CDES-SL1	#L2 LHSI	#L2 PSV	#CDES-LABEL-SL1	No.	Conseq.	
				1		
				2	#CET LIMITED CD,#L2 ENTRY	
				3		
				4	#CET1 HI PRESSURE,#L2 ENTRY	
				5		
				6	#CET1 HI PRESSURE,#L2 ENTRY	

EPR6755 T2

Figure 19C-24—CDES Link Event Tree for CDES SL1D



EPR6760 T2

Figure 19C-25—CDES Link Event Tree for CDES SLD

Entry from SLD CDES			
	#CDES-SLD	#CDES-LABEL-SLD	No.
		1	
		2	#CET1 HI PRESSURE,#L2 ENTRY

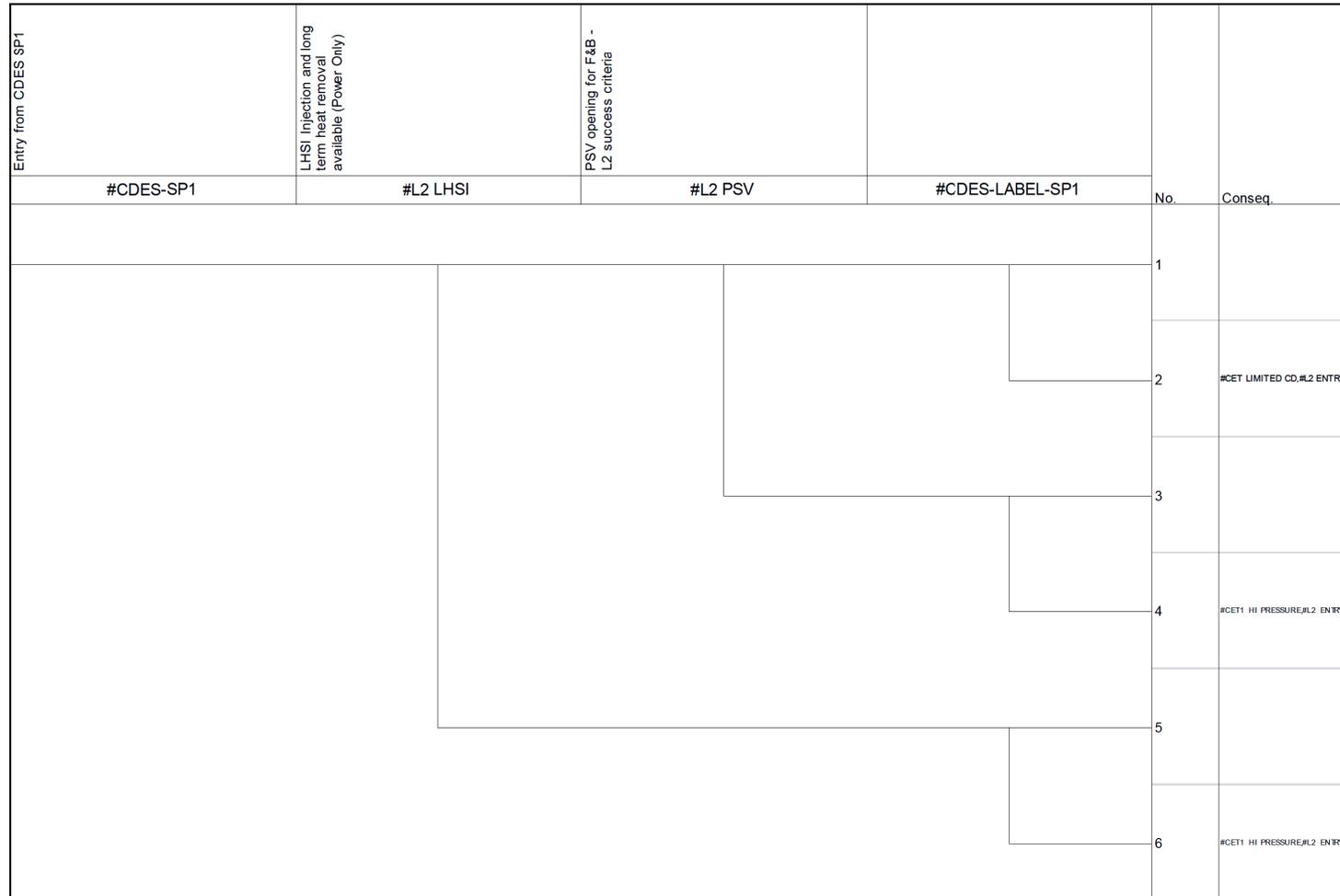
EPR6765 T2

Figure 19C-26—CDES Link Event Tree for CDES SP

Entry from SP CDES	#CDES-SP	#CDES-LABEL-SP	No.	Conseq.
			1	
			2	#CET1 HI PRESSURE#L2 ENTRY

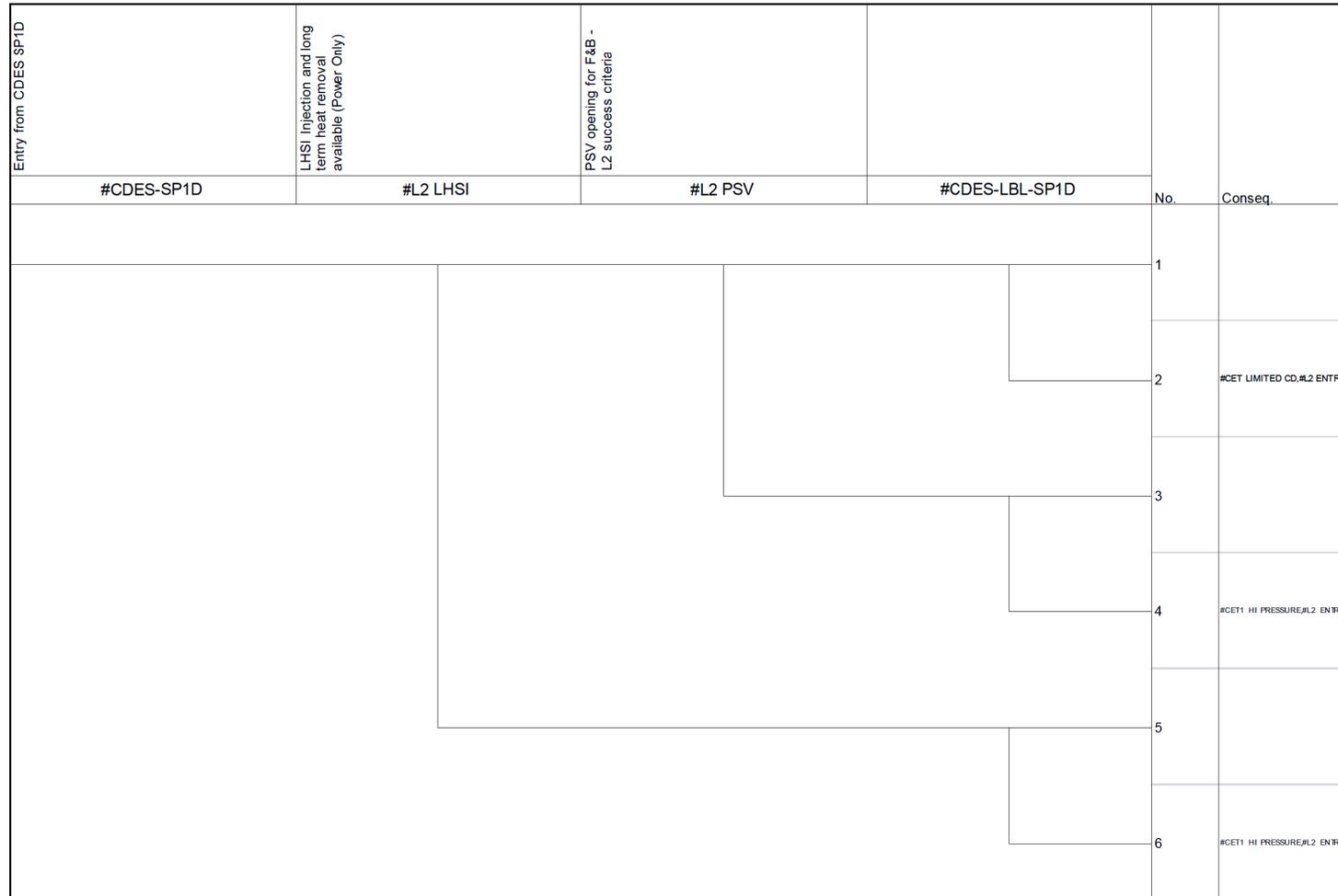
EPR6770 T2

Figure 19C-27—CDES Link Event Tree for CDES SP1



EPR6775 T2

Figure 19C-28—CDES Link Event Tree for CDES SP1D



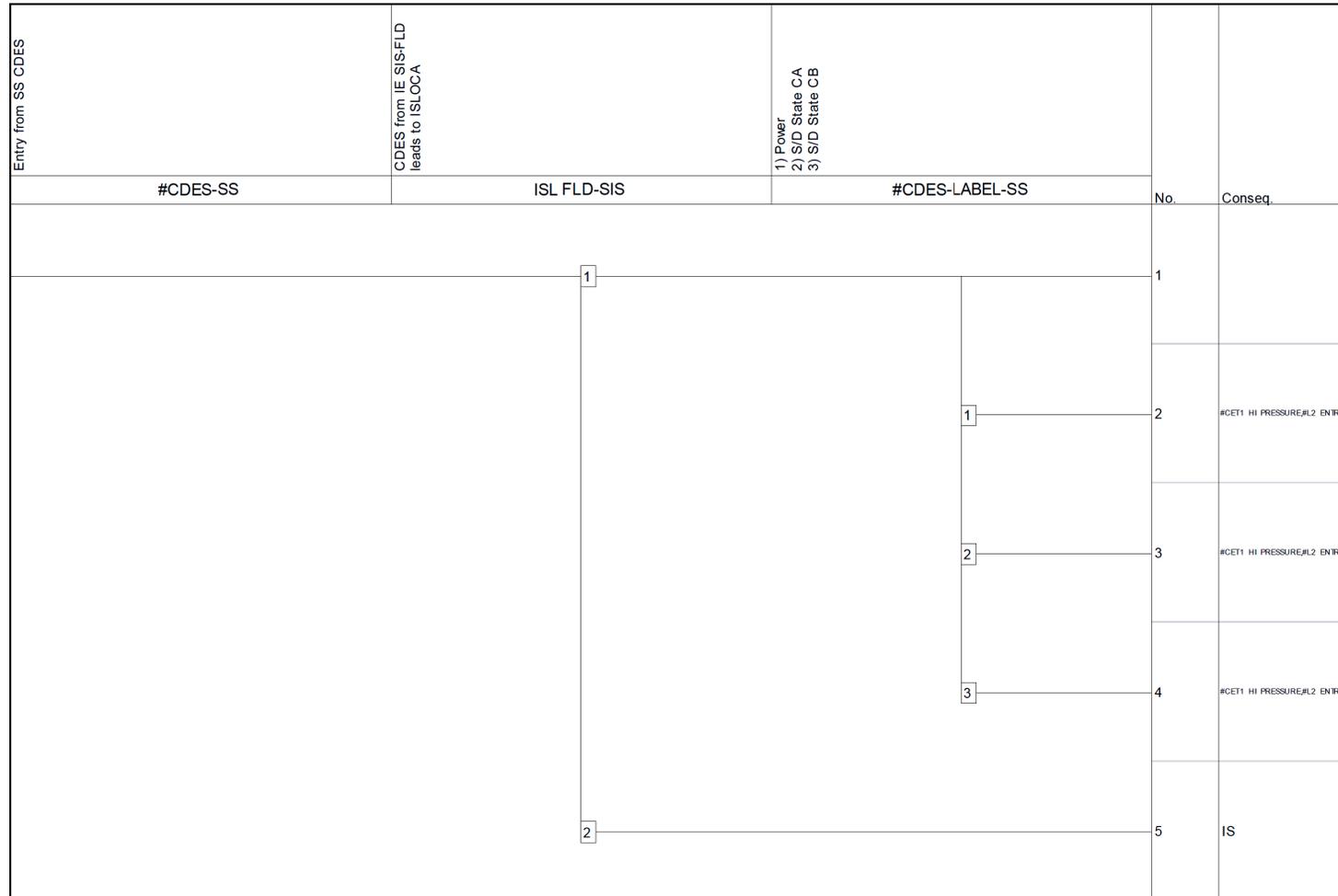
EPR6780 T2

Figure 19C-29—CDES Link Event Tree for CDES SPD

Entry from CDES SPD			
	#CDES-SPD	#CDES-LABEL-SPD	No.
		1	
		2	#CET1 HI PRESSURE,#L2 ENTRY

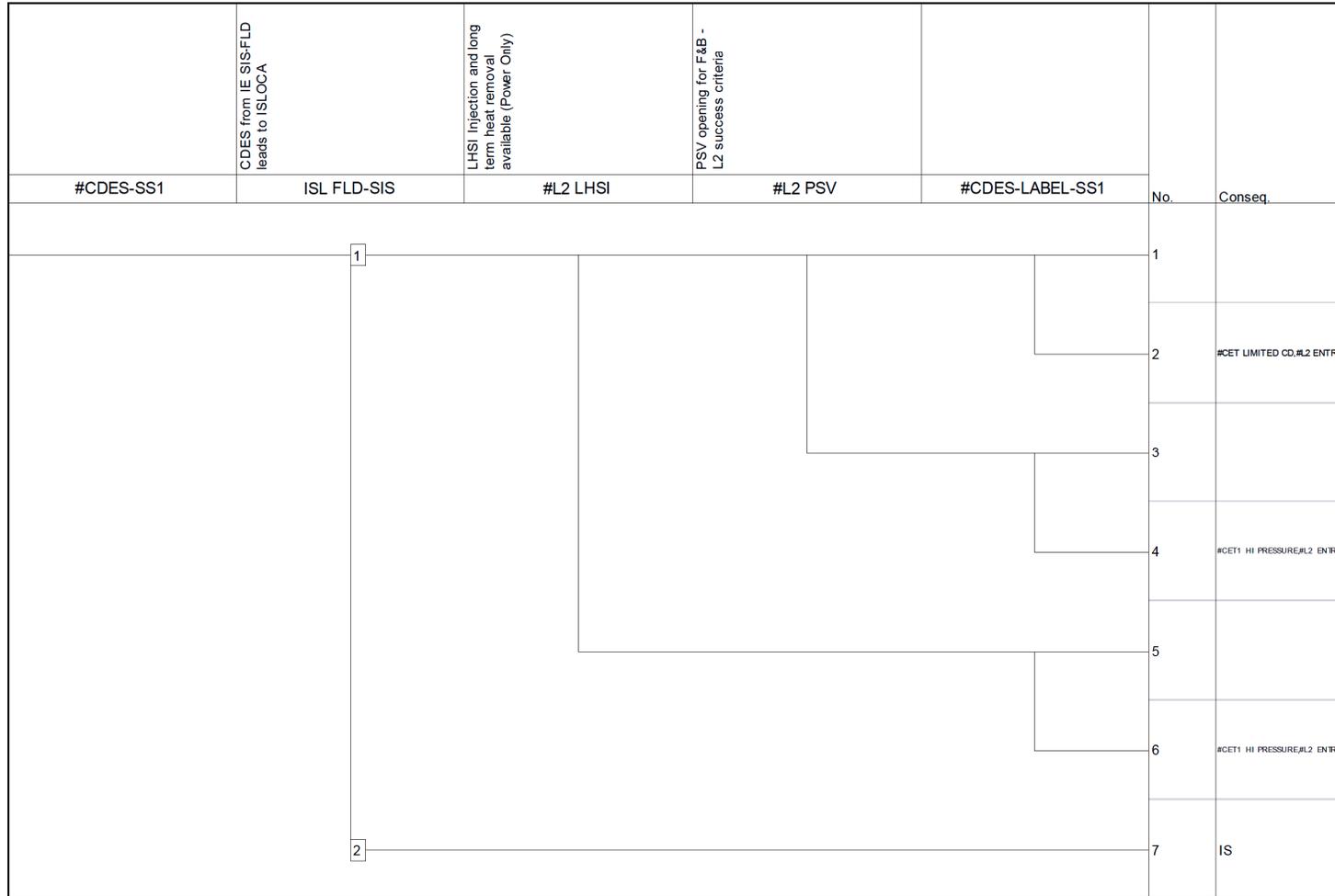
EPR6785 T2

Figure 19C-30—CDES Link Event Tree for CDES SS



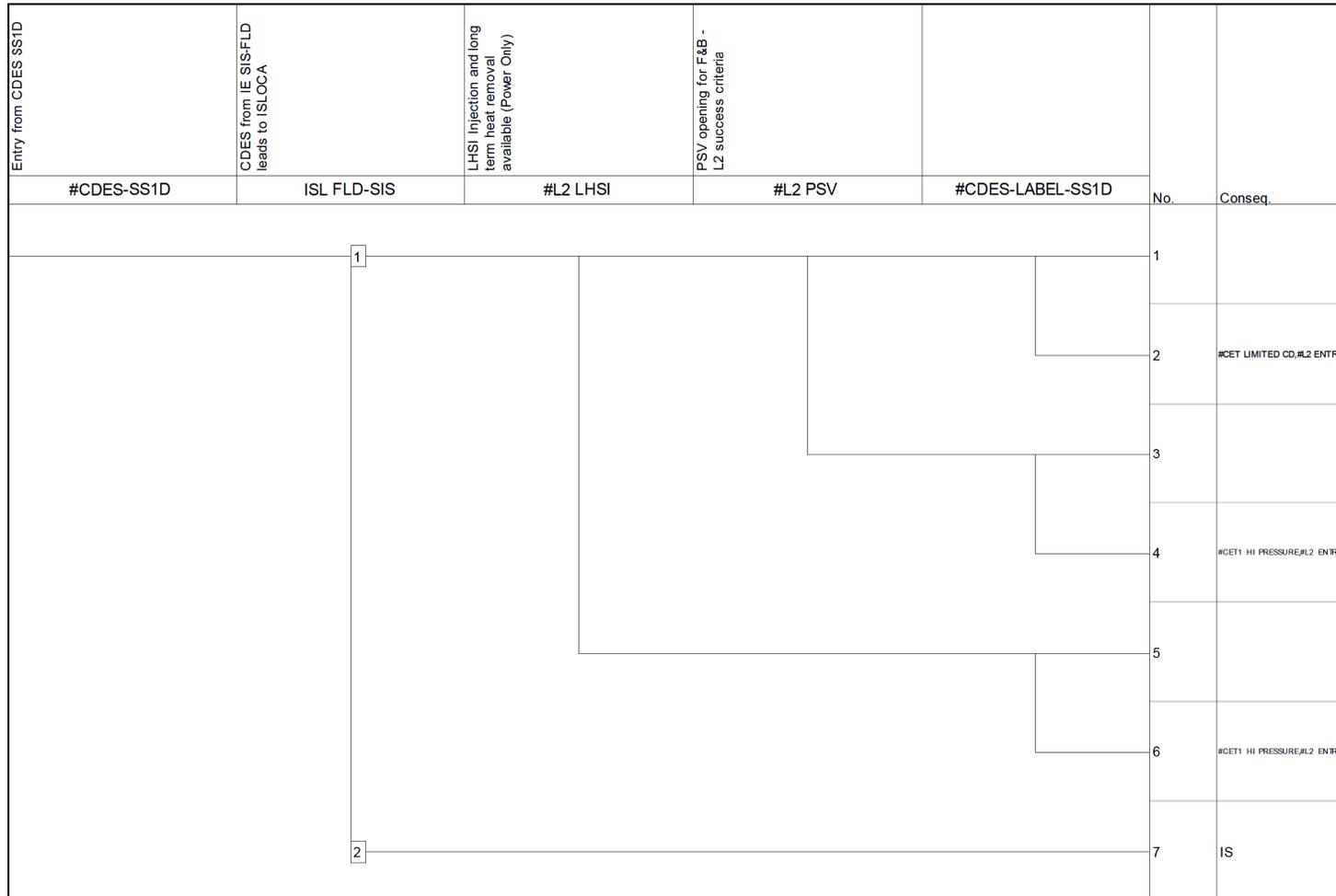
EPR6790 T2

Figure 19C-31—CDES Link Event Tree for CDES SS1



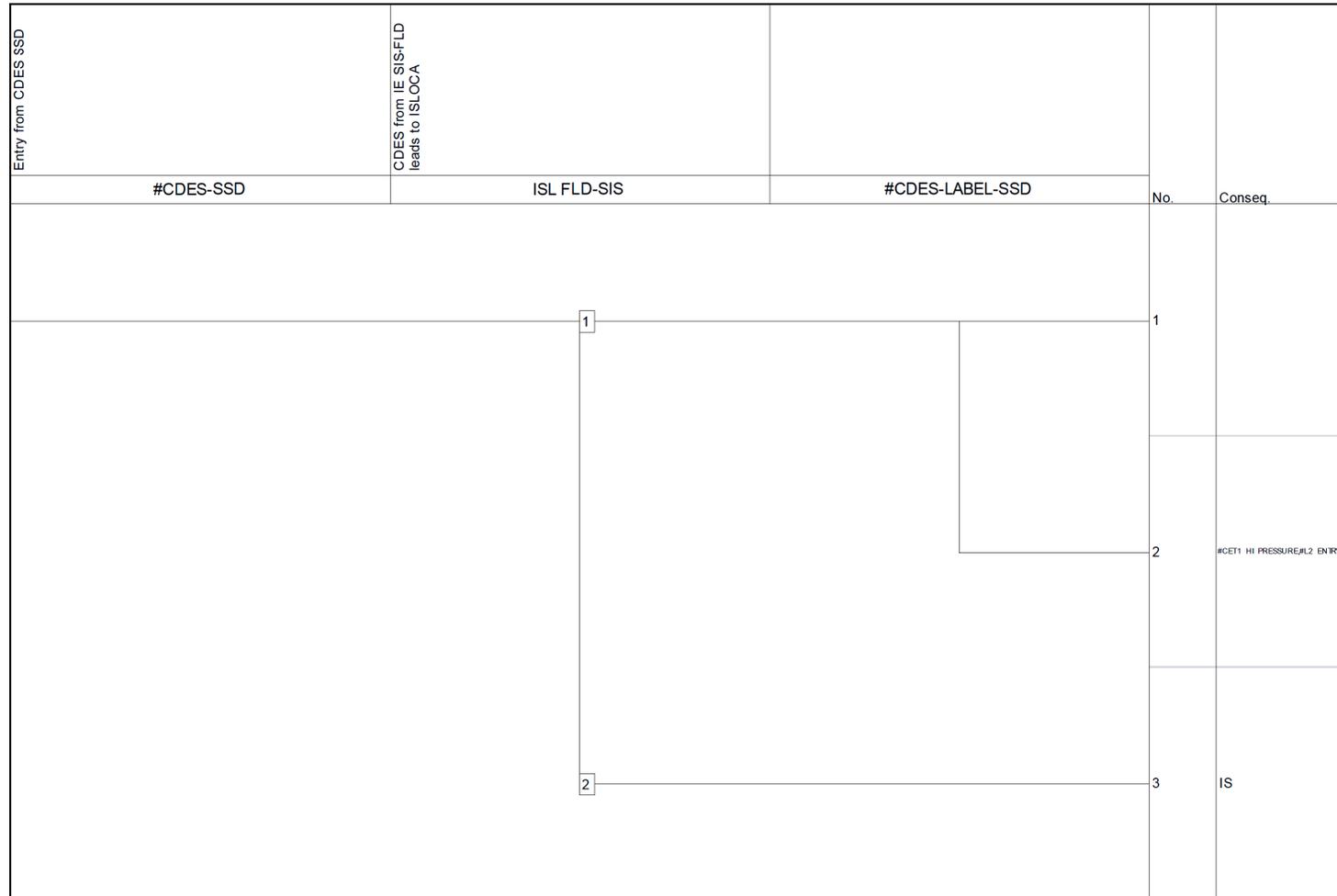
EPR6795 T2

Figure 19C-32—CDES Link Event Tree for CDES SS1D



EPR6800 T2

Figure 19C-33—CDES Link Event Tree for CDES SSD



EPR6805 T2

Figure 19C-34—CDES Link Event Tree for CDES TP

Entry from TP CDES	Label as CDES TP		
#CDES-TP	#CDES-LABEL-TP	No.	Conseq.
		1	
		2	#CET1 HI PRESSURE,#L2 ENTRY

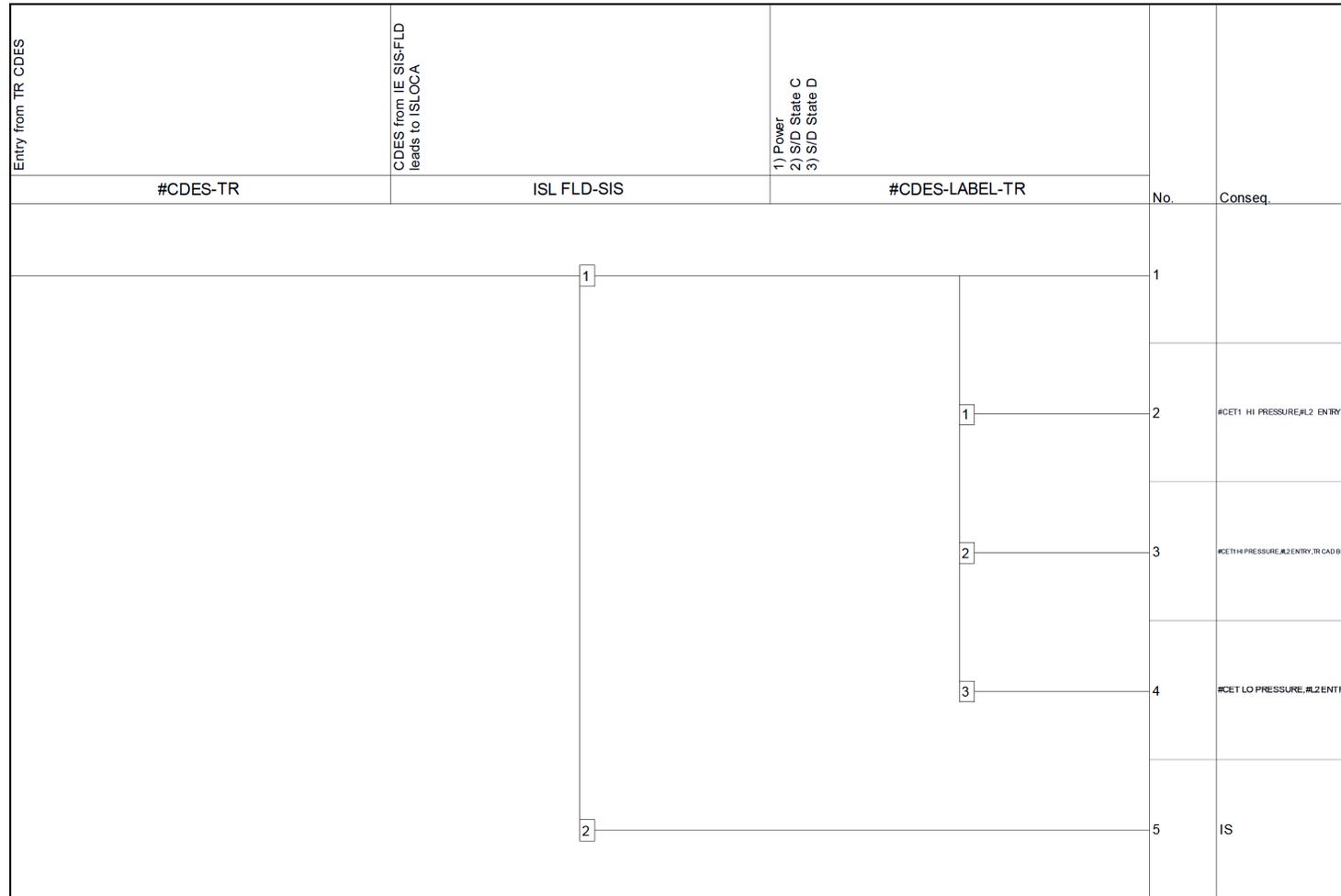
EPR6810 T2

Figure 19C-35—CDES Link Event Tree for CDES TP1

Entry from CDES TP1	LHSI / Injection and long term heat removal available (Power Only)	PSV opening for F&B - L2 success criteria			
#CDES-TP1	#L2 LHSI	#L2 PSV	#CDES-LABEL-TP1	No.	Conseq.
				1	
				2	#CET LIMITED CD,#L2 ENTRY
				3	
				4	#CET1 HI PRESSURE,#L2 ENTRY
				5	
				6	#CET1 HI PRESSURE,#L2 ENTRY

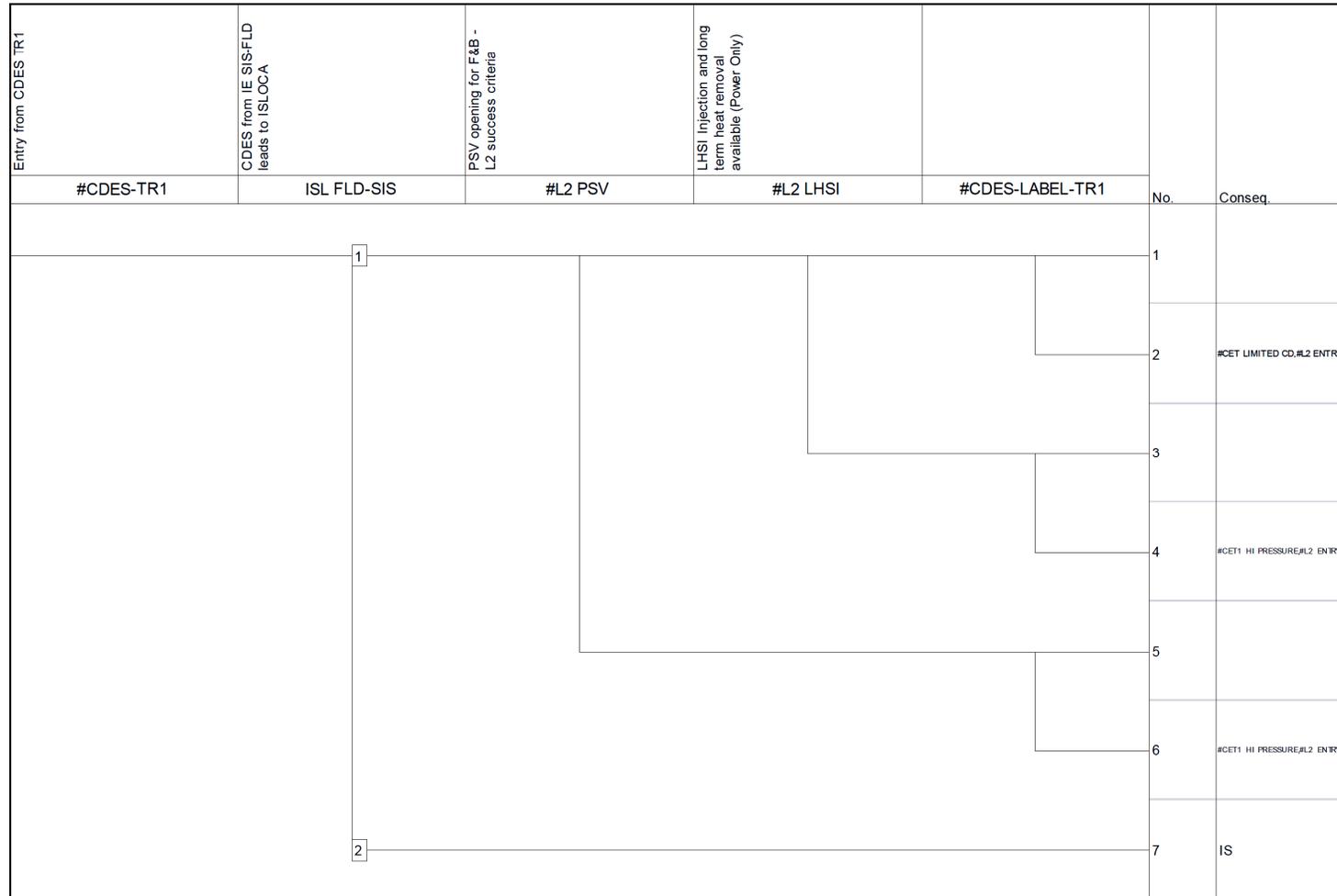
EPR6815 T2

Figure 19C-36—CDES Link Event Tree for CDES TR



EPR6820 T2

Figure 19C-37—CDES Link Event Tree for CDES TR1



EPR6825 T2

Figure 19C-38—CDES Link Event Tree for CDES TR1D

Entry from CDES TR1D	PSV opening for F&B - L2 success criteria	LHSI injection and long term heat removal available (Power Only)			
#CDES-TR1D	#L2 PSV	#L2 LHSI	#CDES-LABEL-TR1D	No.	Conseq.
				1	
				2	#CET LIMITED CD,#L2 ENTRY
				3	
				4	#CET1 HI PRESSURE,#L2 ENTRY
				5	
				6	#CET1 HI PRESSURE,#L2 ENTRY

EPR6830 T2

Figure 19C-39—CDES Link Event Tree for CDES TRD

Entry from CDES TRD			
	#CDES-TRD	#CDES-LABEL-TRD	No.
		1	
		2	#CET1 HI PRESSURE,#L2 ENTRY

EPR6835 T2

Figure 19C-40—CDES Link Event Tree for CDES TRANN

Entry from CDES TRANN	#CDES-TRANN	#CDES-LABEL-TRANN	No.	Conseq.
			1	
			2	#CET1 HI PRESSURE,#L2 ENTRY

EPR6840 T2