B.1.2 Rationale ISO/PAS 8800

Cell	Rationale Coverage	Rationale Depth
R9	**strong coverage**: links completeness to both external requirements and insufficiency prevention	**strong depth**: ”refined to the degree suitable for initiating the AI safety lifecycle”
U9	**strong coverage**: achievement of allocated safety requirements and prevention of functional insufficiencies	**very strong depth**: ”... AI safety requirements are reasonable to either ensure the achievement of the safety requirements ... or prevent or mitigate the functional insufficiencies...”
W9	**weak coverage**: only incomplete conformance	**moderate depth**: ”...the AI system does not fully conform to the AI safety requirements”
X9	**weak coverage**: scope restricted to limited input space	**strong depth**: ”...the AI safety requirements are only fulfilled for a limited part of the input space”
AT9	**strong coverage**: test cases verifying allocated safety requirements across specified input space	**strong depth**: ”Test cases ... shall adequately verify the AI safety requirements ... within the specified input space of the AI system...”
AC10	**weak coverage**: measures (architectural, development, combined) to reduce AI error	**strong depth**: ”Sufficient measures ... to reduce the risk resulting from ... AI errors...”
BJ10	**moderate coverage**: tool confidence only	**moderate depth**: ”Confidence shall be demonstrated that software tools ... are suitable to be used to support activities or tasks ...”
BJ14	**very weak coverage**: tool suitability leading to fault-free operation under normal conditions	**very weak depth**: ”...software tools used to develop, verify and deploy safety related AI models are suitable...”
BD16	**weak coverage**: focus on assurance process (activity of that includes identification and resolution procedure of safety issues during operation	**weak depth**: ”The process and its activities necessary to assure the AI safety ...”
BD17	**weak coverage**: addresses operational assurance, which includes resolution procedure of safety issues	**weak depth**: ”... resolution procedure” of the assurance activities
AC18	**strong coverage**: measures (architectural, development, combined) ensuring robustness against AI errors ”	**very strong depth**: ”Sufficient measures ... to reduce the risk ...”
AP18	**strong coverage**: confidence in absence of unintended functionality	**strong depth**: "The AI System shall be verified ... for ... confidence in the absence of unintended functionality ...”
BK18	**very strong coverage**: training and evaluation principles for avoiding safety-related faults	**strong depth**: ”Appropriate principles for data-driven AI models shall be applied to training and evaluation to ensure control or avoidance of safety-related faults...”
BD19	**moderate coverage**: self monitoring implied through assurance argument	**moderate depth**: ”These activities include the identification of safety issues of the AI system during operation...”
BD36	**moderate coverage**: user notification but not broader communication noted	**strong depth**: ”...notify properly to the user of AI system regarding this termination”

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D37	**strong coverage**: requirement establishes full lifecycle documentation with tailoring and rationale	**very strong depth**: "The tailoring is supported by a rational for why the tailored AI safety lifecycle is appropriate to achieve AI safety"
K37	**weak coverage**: indirectly supports documentability	**moderate depth**: "...including adding this document as a relevant standard of ISO 26262-2"
L37	**strong coverage**: introduces safety assurance argument into safety case	**very strong depth**: "...including the use of a safety assurance argument as part of the safety case of ISO 26262-2"
M37	**strong coverage**: broadens safety plan to explicitly include AI safety activities	**strong depth**: "... extending the safety plan of ISO 26262-2 to include the safety activities of this document"
N37	**strong coverage**: broad management adaptation and tailoring of work products	**strong depth**: "...including tailoring ISO 26262-2:2018 ... to address the work products of this document..."
U37	**strong coverage**: justification demanded	**very strong depth**: "A justification shall be provided ..."
Z37	**strong coverage**: justification of AI technologies and methods	**moderate depth**: "A justification shall be provided that the selected AI technologies and AI methods are capable of fulfilling the AI safety requirements..."
AD37	**weak coverage**: focus only on supporting argument	**moderate depth**: 'The effectiveness of the chosen combination of architectural and development measures ... shall be supported by an argument"
AO37	**moderate coverage**: verification evidence demanded	**strong depth**: "The AI system shall be verified to provide evidence for... conformity to the AI safety requirements"
AP37	**weak coverage**: implication of documentation through evidence provision	**moderate depth**: 'The AI system shall be verified to provide evidence..."
BI37	**strong coverage**: documentation of error sources	**strong depth**: "...shall be analysed to identify, mitigate and document possible sources of errors"
W42	**weak coverage**: one single case of non conformance, limited coverage for analysability	**moderate depth**: That "the AI system does not fully conform to the AI safety requirements" "...shall be identified..."
X42	**weak coverage**: input space limitation	**moderate depth**: That "the AI safety requirements are only fulfilled for a limited part of the input space" "shall be identified ..."
AE42	**strong coverage**: Safety analysis of outputs and architecture	**strong depth**: "Safety analysis of the AI system outputs and, where reasonably practicable, of its architectural elements shall be performed..."

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AF42	**strong coverage**: identification and evaluation of environment differences with direct link to analysis of impact	**strong depth**: ”The differences between the development environment and the target execution environment shall be identified and evaluated regarding their potential impact on the safety requirements...”
AL42	**very strong coverage**: safety analyses for insufficiencies, root causes, and violations	**very strong depth**: ’The dataset lifecycle activities shall include safety analyses to identify potential dataset insufficiencies, their root causes ...”
AY42	**very strong coverage**: application of safety analysis techniques	**very strong depth**: ”Safety analysis techniques ... shall be applied”
BA42	**strong coverage**: analysis of faults, insufficiencies, and causes	**strong depth**: ”Safety analysis shall identify the safety-related faults, potential functional insufficiencies and their potential underlying issues...”
BB42	**weak coverage**: safety analysis linked to error causes	**strong depth**: ”Safety analysis results shall be used to identify prevention or mitigation measures to address the causes of the AI errors...”
BG42	**moderate coverage**: evaluation and modification of effectiveness of countermeasures	**strong depth**: ”The effectiveness of the countermeasures shall be evaluated ...”
BI42	**very strong coverage**: analysis of processes, tools, and work products linked to lifecycle	**very strong depth**: ”Processes, tools and work products used to develop safety-related AI models shall be analysed. . . ”
G43	**moderate coverage**: requirement addresses adaptation of activities but not modification process	**strong depth**: ”The activities described in ISO 26262-2 shall be adapted...”
Q44	**weak coverage**: restricted scope to confirmation measures and assurance argument	**moderate depth**: ”Confirmation measures of 7.3.4 shall be applied to the assurance argument”
AG44	**very weak coverage**: mentioning of AI models to be trained	**strong depth**: ”...shall be trained using the training dataset and evaluated using the validation dataset”
AO44	**strong coverage**: verification tied to assessing requirement conformity	
AP44	**very strong coverage**: explicit demand for verification	**very strong depth**: ”The AI system shall be verified to provide evidence...”
AQ44	**very strong coverage**: addresses stand-alone and integrated AI components testing	**very strong depth**: ”Testing of an AI system shall be performed on the AI components that can be tested stand-alone and on the integrated AI system.”
AR44	**very strong coverage**: derivation of test cases with best-practice methods	**very strong depth**: ”Test cases for the verification of the AI components shall be derived using best practices for test case derivation...”
AS44	**weak coverage**: focus only on inclusion of pass/fail	**very strong depth**: ”Each test case of an AI component shall include pass/fail criteria...”

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AT44	**very strong coverage**: verification of AI safety requirements across specified input space	**very strong depth**: 'Test cases of an AI component shall adequately verify the AI safety requirements allocated to the AI component within the specified input space of the AI system..."
AV44	**strong coverage**: verification of integration conformity	**strong depth**: "The AI system integration shall be verified ...
AW44	**strong coverage**: verification evidence of integration	**strong depth**: "The AI system integration shall be verified to provide evidence... satisfaction of the AI safety requirements"
BC44	**moderate coverage**: safety analysis linked to verification but only for completeness	**strong depth**: "Safety analysis results shall be used to verify the completeness of the AI safety requirements"
BJ44	**strong coverage**: assurance and verification done through confident tools	**strong depth**: "Confidence shall be demonstrated that software tools ... are suitable to be used to support activities or tasks ..."
Y53	**very strong coverage**: identification of AI safety requirements ensuring safe operation under hazards	**very strong depth**: "AI safety requirements shall be identified to support the measures ensuring AI safety during operation...monitoring of the uncertainty in the current situation...measures to prevent hazardous behaviour...supporting the continuous improvement of the AI system..."
AB53	**strong coverage**: sufficient measures across architecture and development to address operational hazards	**very strong depth**: "Sufficient measures, such as architectural, development or a combination of both, shall be defined to ensure the AI safety requirements are fulfilled ..."
AC53	**strong coverage**: measures addressing operational hazards from AI errors	**very strong depth**: "Sufficient measures ... to reduce the risk resulting from contributing AI errors..."
AM53	**moderate coverage**: focus on dataset countermeasures	**strong depth**: "Dataset requirements of the dataset shall: — address the dataset insufficiencies that can lead to violation of the AI safety requirements; — specify countermeasures..."
AP53	**weak coverage**: unintended functionality relates to unsafe states	**weak depth**: "confidence in the absence of unintended functionality and properties..." by following safety standards (e.g. ISO 26262, ISO 21448)
BB53	**strong coverage**: analysis outcomes directly linked to operational hazard mitigation	**strong depth**: "...mitigation measures to address the causes of the AI errors that are potentially violating ... AI safety requirements"
BE53	**moderate coverage**: general on-board and off-board measures	**strong depth**: "Measures can include ... detecting safety-related errors..."
BF53	**moderate coverage**: mitigation after unacceptable risk evaluation	**strong depth**: "...if the risk is deemed unacceptable, countermeasures shall be taken to mitigate the risk"
I54	**weak coverage**: requirement enhances the definition functional safety to AI safety	**weak depth**: "...enhancement of "functional safety" to "AI safety"'

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V54	**very strong coverage**: capability to risk	**very strong depth**: ”capability of a product to identify a course of events or operations that can expose life, property or environment to unacceptable risk”
Y54	**very strong coverage**: identification of AI safety requirements	**very strong depth**: ”AI safety requirements shall be identified to support the measures ensuring AI safety ...”
AE54	**moderate coverage**: indirect identification of hazardous events	**strong depth**: ”... determine whether the safety requirements allocated to the AI system can be met”
AF54	**moderate coverage**: potential impact on safety requirements addressed	**strong depth**: ”...If necessary, appropriate AI architectural and development measures shall be defined.”
AK54	**moderate coverage**: data-related safety properties	**strong depth**: ”Data-related safety properties of the dataset shall be identified ...”
AR54	**moderate coverage**: risks touched only indirectly through methods (error guessing, boundary analysis)	**weak depth**: ”Error guessing based on knowledge or experience can be suited to identify yet unknown edge cases for testing...”
AZ54	**strong coverage**: safety analysis to identify AI errors with potential to violate safety requirements	**very strong depth**: ”Safety analysis of the AI system shall identify the AI errors ... that have the potential to violate ... AI safety requirements”
BA54	**very strong coverage**: identification of safety-related faults and insufficiencies	**very strong depth**: ”...identify the safety-related faults, potential functional insufficiencies and their potential underlying issues...”
BD54	**strong coverage**: identification of safety issues during operation	**strong depth**: ”These activities include the identification of safety issues of the AI system during operation...”
BF54	**strong coverage**: identification and evaluation of safety-related field events	**very strong depth**: ”The identified safety-related field events shall be evaluated ...”
F57	**very strong coverage**: requirement ensures alignment with entire encompassing system safety lifecycle	**very strong depth**: ”The activities of the AI safety lifecycle shall be coordinated with the safety lifecycle activities of the encompassing system...”
AU57	**very strong coverage**: addresses full hierarchical integration process	**strong depth**: ”The AI system integration approach shall specify the steps for integrating the individual AI components hierarchically into higher level AI components...”
AV57	**strong coverage**: safety conformity of integrated AI system	**very strong depth**: ”...the hierarchically integrated AI components and the integrated AI system achieve ... conformity to the AI system architectural design...”
AW57	**very strong coverage**: integration ensuring safety requirements needs to be verified	**very strong depth**:”...the hierarchically integrated AI components and the integrated AI system achieve ... satisfaction of the AI safety requirements”

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AX57	**very strong coverage**: safety validation during and after integration into encompassing system	**very strong depth**: "... validation shall confirm that the safety requirements ... are fulfilled when the AI system is integrated into the encompassing system"
AM60	**very strong coverage**: dataset insufficiencies and countermeasures	**very strong depth**: "...specify countermeasures to prevent the dataset insufficiencies, to mitigate them, or both."
BH60	**very weak coverage**: maintenance activities addressed	**very weak depth**: "Field data collection, AI retraining, re-validation and re-approval, etc. can be executed..."
AI61	**very strong coverage**: dataset lifecycle across development and deployment phases	**strong depth**: 'The dataset lifecycle shall be defined such that it supports iterative development of the dataset taking into account changes in the AI safety requirements..."
AJ61	**strong coverage**: dataset lifecycle includs maintenance	**strong depth**: "The dataset lifecycle shall include activities that relate to ... management and maintenance of the datasets..."
AJ62	**very weak coverage**: general lifecycle activities	**moderate depth**: "The dataset lifecycle shall include activities that relate to ... verification, validation..."
AL62	**weak coverage**: insufficiencies addressed but no demand on coherence	**moderate depth**: "...identify potential dataset insufficiencies, their root causes and their potential to cause a violation of AI safety requirements"
AJ63	**moderate coverage**: verification and validation	**strong depth**: "The dataset lifecycle shall include activities that relate to ... verification, validation..."
AH66	**weak coverage**: dataset lifecycle definition	**weak depth**: "A dataset lifecycle shall be defined for the datasets used in the development of the AI system"
S70	**strong coverage**: AI safety requirements linked to external sources, assumptions, or critical scenarios	**very strong depth**: "the refined AI safety requirements shall ... trace to the safety requirements allocated to the AI system ... assumptions or critical scenarios"
T70	**strong coverage**: AI safety requirements linked to influencing factors and root causes	**very strong depth**: '...the ... AI safety requirements shall ... address and trace to the potential influencing factors or root causes ..."
AN70	**very strong coverage**: dataset requirements linked with AI safety requirements	**very strong depth**: "Traceability shall be ensured between the dataset requirements and the AI safety requirements"
AG76	**very strong coverage**: separation of datasets for distinct purposes	**very strong depth**: "...trained using the training dataset and evaluated using the validation dataset"
AJ77	**very strong coverage**: entire dataset lifecycle spans from gathering to maintenance	**very strong depth**: "The dataset lifecycle shall include ... gathering, creation, safety analysis, verification, validation, management and maintenance of the datasets..."

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BG83	**moderate coverage**: ongoing observation of countermeasure effectiveness	**very strong depth**: "...The countermeasures shall be modified if the residual risk is still unacceptable."
E87	**strong coverage**: requirement applies to all phases of AI safety lifecycle	**very strong depth**: "At each phase within the AI safety life cycle, work products shall be defined to support the safety assurance claims"
H87	**strong coverage**: lifecycle integration broadly touches traceability aspects	**strong depth**: "The activities described in ISO 26262-2 shall be adapted in order to address the management of AI safety, including ... the integration of the AI safety lifecycle..."
K87	**weak coverage**: links AI safety to ISO 26262	**moderate depth**: "...adding this document as a relevant standard..."
L87	**moderate coverage**: focus on specific mechanism, safety assurance argument	**very strong depth**: "...including the use of a safety assurance argument as part of the safety case of ISO 26262-2"
M87	**strong coverage**: extending established ISO 26262 safety plan to AI safety activities	**very strong depth**: "...extending the safety plan of ISO 26262-2 to include the safety activities of this document"
N87	**very strong coverage**: extends traceability across tailored work products	**moderate depth**: "...tailoring ISO 26262-2:2018, Table 1, to address the work products of this document..."
O87	**moderate coverage**: focus on assurance argument	**very strong depth**: "An assurance argument for the fulfilment of the safety requirements allocated to the AI system shall be provided..."
P87	**strong coverage**: assurance argument linked to relevant work products across the AI safety lifecycle	
S87	**very strong coverage**: explicit trace links across multiple artifact sources	**very strong depth**: "the refined AI safety requirements shall ... trace to the safety requirements allocated to the AI system ..."
T87	**very strong coverage**: explicit trace links between requirements, influencing factors, and root causes across artifacts	**very strong depth**: 'the AI safety requirements shall ... address and trace to the potential influencing factors or root causes of functional insufficiencies and triggering conditions"
AA87	**moderate coverage**: allocation of safety requirements to components	**very strong depth**: "AI safety requirements shall be allocated to AI components"