Risk-Informed Licensing Requirements for Manufacturing and Procurement of Components at a new NPP in Hungary

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Abstract: According to one of the recent amendments to the Hungarian nuclear safety regulations, risk insights must be considered to specify the licensing requirements for manufacturing and procurement of systems, structures and components (SSCs) of deterministic safety classes 2 and 3 of a new nuclear power plant. The risk-informed ranking of SSCs helps to underpin the decision whether it is justified that the licensee has to provide detailed information about an SSC to the Hungarian Atomic Energy Authority during manufacturing and procurement licensing (notification obligation), or it is appropriate and adequate to submit summary information (briefing obligation). This approach allows the licensee to differentiate in the detail of the information to be submitted to the nuclear safety authority, although the documentation of the licensing process by the licensee is practically the same for the different categories of SSCs. Irrespective of the decision on notification obligation versus briefing obligation, the nuclear safety authority can perform a review of the full scope licensing documentation for any components, including those that are originally subject to briefing obligation. First, a methodological document was prepared for the grouping of equipment for licensing purposes with the integrated use of risk information and other safety considerations for the planned Paks II Nuclear Power Plant so that compliance with the Hungarian nuclear regulatory requirements is ensured. This approach led to the definition of risk-informed licensing groups. Methodological development began with a review of applicable good practices and related reports and guidelines including relevant international and domestic technical literature. The methodology builds largely upon previous efforts in Hungary that were aimed at developing a risk-informed safety classification framework for the equipment of the existing Paks Nuclear Power Plant. In accordance with the predefined work plan, prequalification was carried out for all the components that belong to deterministic safety classes 2 and 3, and are included in the PSA model of the plant. The prequalification was thoroughly reviewed by a panel of experts. Based on the review findings, the prequalification was basically repeated. The expert panel assigned risk-informed licensing groups to all SSCs outside the scope of the PSA model. As a result, it was possible to determine whether an SSC was subject to notification obligation or briefing obligation. This paper summarizes the methodology for the risk-informed definition of licensing groups, the risk-informed analysis and its results.

Keywords: PSA, Risk-Informed Ranking, Manufacturing and Procurement, Licensing Requirements.

1. INTRODUCTION

According to one of the recent amendments to the Hungarian nuclear safety regulations, risk insights must be considered to specify the licensing requirements for manufacturing and procurement of systems, structures and components (SSCs) of deterministic safety classes 2 and 3 of a new nuclear power plant. The risk-informed ranking of SSCs helps to underpin the decision whether it is justified that the licensee has to provide detailed information about an SSC to the Hungarian Atomic Energy Authority during manufacturing and procurement licensing (notification obligation), or it is appropriate and adequate to submit summary information (briefing obligation). This approach allows the licensee to differentiate in the detail of the information to be submitted to the nuclear safety authority, although the documentation of the licensing process by the licensee is practically the same for the different categories of SSCs. Irrespective of the decision on notification obligation versus briefing obligation, the nuclear safety authority can perform a review of the full scope licensing documentation for any components, including those that are originally subject to briefing obligation. It needs to be highlighted that ranking of SSCs does not aim at modifying the existing deterministic safety classes of the equipment in any sense; it only enables the division between notification and briefing obligation during manufacturing and procurement licensing. The Probabilistic Safety Assessment (PSA) performed by the designer for the purposes of the Implementation License Application was the basis of the assessment. Although this PSA has been reviewed by various groups of PSA practitioners, including an expert group of the International Atomic Energy Agency, it is considered a basic design stage PSA. Therefore, several further, mostly deterministic aspects needed to be taken into account during the definition of licensing groups. Moreover, integrated safety assessment also assumes a combined, mutually supporting use of probabilistic and deterministic reasoning.

2. REVIEW OF RELEVANT TECHNICAL LITERATURE

Use of PSA information is an essential part of integrated risk-informed decision-making (RIDM) at NPPs. For this purpose, quantitative results and qualitative insights from PSA should be applied systematically and in a structured manner to help ensure that risk aspects, from the perspectives of PSA, are factored well into the decision-making process. There are several PSA applications that can support RIDM, see [1] and [2] for actual and suggested PSA applications based on good regulatory and licensee practices worldwide. In its literal sense, there is no PSA application that deals solely with the topic of the definition of risk-informed licensing groups of SSCs. However, the definition of licensing groups and the fulfilment of associated (graded) licensing requirements can, in effect, be regarded as a well-defined subset of the treatment of SSCs. Accordingly, the methods used in the risk-informed treatment of SSCs were seen applicable to the current task if their good features are retained, and the actual evaluation and assessment steps are adapted to the needs and boundary conditions of grouping SSCs for licensing purposes. Consequently, applicable good practices and related reports and guidelines including relevant international and domestic technical literature were reviewed to support the development of an applicable methodology.

Several PSA applications are related to the treatment of SSCs from various aspects. Although it was not the purpose of the review to list and characterize all of them, two applications are of particular importance from the point of view of defining licensing groups for SSCs. These are (1) risk-informed categorization of SSCs, and (2) safety significance determination of SSCs to support the establishment and operation of a programme for monitoring the effectiveness of maintenance, as enforced by nuclear safety regulations in the United States for example [3] and subsequently implemented in some other countries that operate NPPs. The following characteristics of these applications are of paramount importance for the definition of licensing groups for SSCs:

- PSA information (both quantitative and qualitative) is considered in a truly integrated manner so that safety aspects not necessarily and/or not specifically addressed in PSA are raised and evaluated by a multidisciplinary panel of experts, ensuring that the process is comprehensive and risk-informed, as opposed to being risk-based.
- Risk-based ranking of SSCs obtained from the calculation and comparison of risk importance measures, and other risk metrics with pre-defined classification criteria is in the core of the assessment of safety significance for SSCs.

During the methodology development, the feature described in the first bullet was implemented. Naturally, modifications were made that deemed necessary for this specific application. The corresponding details on how PSA information is used in integration with other safety considerations are provided in the different sub-sections of Section 4 including Section 4.4 and Section 4.5 in particular.

Concerning the feature described in the second bullet, examples on the approaches followed (1) to perform risk-informed categorization of SSCs and use this information in risk-informed decision-making, and (2) in monitoring the effectiveness of maintenance were collected and reviewed. When developing the methodology for risk-informed definition of licensing groups of SSCs, use was made of the methods applied internationally and in Hungary to incorporate quantitative information on risk importance of SSCs into the grouping process. The following examples were the most valuable, though not the only information sources:

- risk-informed categorization of SSCs:
    - International Atomic Energy Agency [1,4-6]
    - Western European Nuclear Regulators' Association [7]
    - United States [8-10]
    - Finland [11]
    - Hungary [12,13]
- monitoring maintenance effectiveness:
    - United States [14-16]
    - Hungary [17]

In addition, characteristic international examples on the use of information of risk significance of SSCs in important regulatory activities were also studied, including documents from the International Atomic Energy Agency, the U.S. Nuclear Regulatory Commission, the Finnish Radiation and Nuclear Safety Authority and the State Nuclear Regulatory Inspectorate of Ukraine.

3. GENERAL OVERVIEW OF THE PROCESS OF RISK-INFORMED DEFINITION OF LICENSING GROUPS

First, a methodological document [18] was prepared for the grouping of equipment for licensing purposes with the integrated use of risk information and other safety considerations for the planned Paks II Nuclear Power Plant so that compliance with the Hungarian nuclear regulatory requirements is ensured. This approach led to the definition of risk-informed licensing groups. The methodology builds largely upon previous efforts in Hungary that were aimed at developing a risk-informed safety classification framework for the equipment of the existing Paks Nuclear Power Plant [12].

Figure 1 gives a high level overview of the process as proposed in [18] to be followed for risk-informed definition of licensing groups including the analysis steps and possible transitions between these steps. The initial analysis tasks for grouping are relatively straightforward, if the analysts are well familiar with the plant as well as its PSA model and results, and are also knowledgeable about PSA methods in general. The completion of these tasks results in a preliminary grouping of equipment. This part of the process, i.e. steps 2 and 3 together, is called prequalification. However, there is also a need for reviewing the results obtained from these steps by a group of experts having comprehensive and in-depth knowledge in different technical areas.

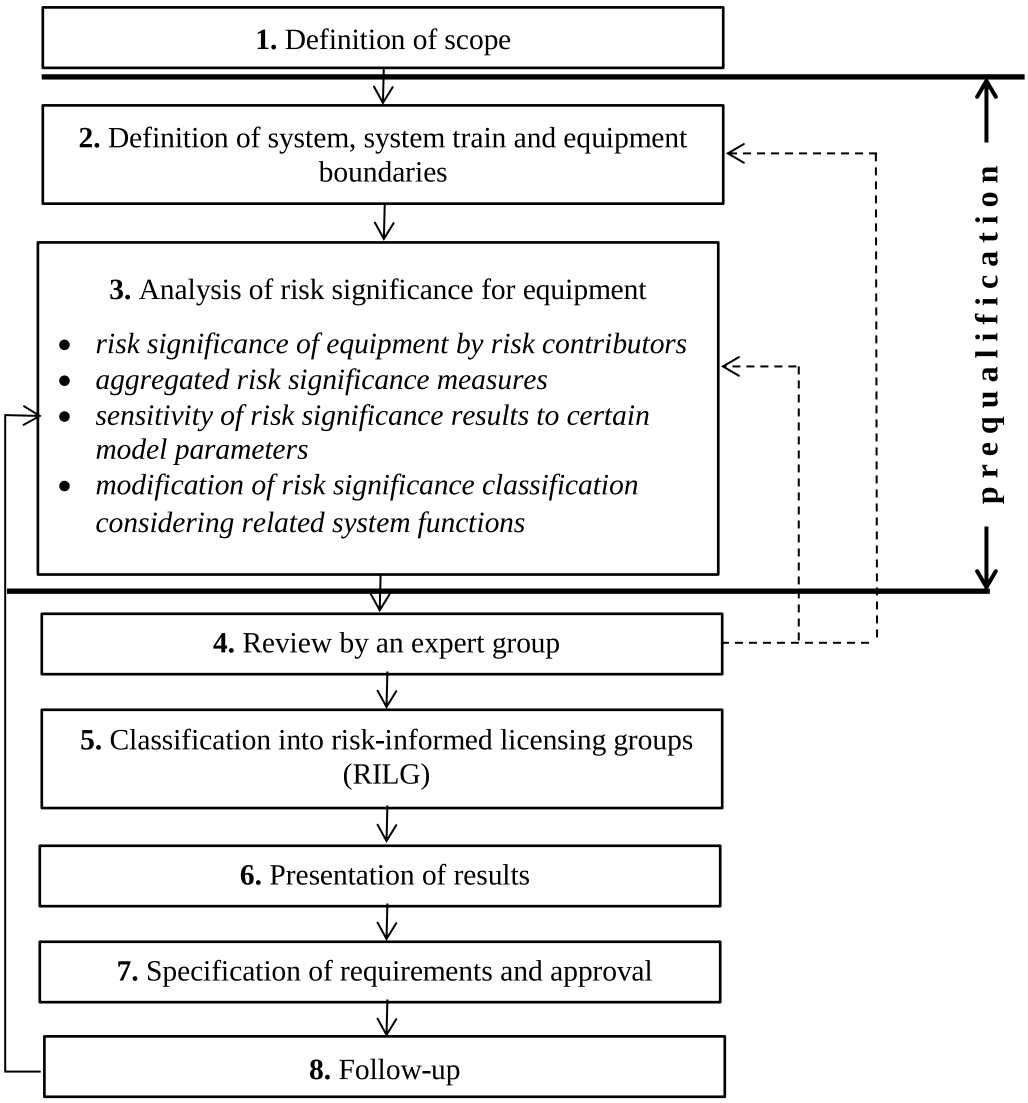

Figure 1. Process for Risk-Informed Definition of Licensing Groups

4. ANALYSIS STEPS OF THE RISK-INFORMED DEFINITION OF LICENSING GROUPS

The analysis was performed in accordance with the process depicted on Figure 1. The following subsections summarize important methodological aspects by giving an overview of every major analysis step, except for follow-up, as this task has not been completed yet.

4.1. Definition of Scope

The scope of applying risk-informed definition of licensing groups was specified in the first step in terms of the classes of SSCs that should be subject to risk-informed grouping. In accordance with the planned modification of the Hungarian Nuclear Safety Codes, risk insights should be considered to specify the licensing requirements for manufacturing and procurement of systems, structures and components (SSCs) that belong to deterministic safety classes 2 and 3. Consequently, all SSCs in these two safety classes were within the scope of the analysis. It is noted that the PSA model includes components belonging to deterministic safety classes 1 and 4 too; however, the group definition and the evaluation of such components was beyond the scope of the analysis.

4.2. Definition of System, System Train and Equipment Boundaries

Initially, it was defined what items/parts belong to each system, system train or equipment for the purposes of risk-informed definition of licensing groups.

One set of basic information used for grouping was obtained from the PSA. In risk assessment, the component boundaries are – ideally – defined by decomposing a system into components for which the most realistic, best substantiated and the least uncertain failure data can be obtained. However, once the risk-informed licensing groups have been determined, the licensing requirements may be different for such pieces of equipment that are considered separate components in the design. In practice, the components are bounded and treated as a unit according to the procurement, the commonality of the manufacturer and the practicability of concurrent maintenance. With considerations to equipment boundaries used in PSA and equipment boundaries originated from design, manufacturing, procurement, operation and maintenance, the equipment boundaries to be used for risk-informed definition of licensing groups were set as follows.

When the decomposition of equipment in the PSA was more detailed than what was physically handled by the designer or by the licensee, then the risk-informed licensing groups were defined on the decomposition level of the PSA. When, on the other hand, the equipment was classified and designed to be treated in smaller parts than what was modelled in the PSA, the PSA could not yield different measures of importance to these sub-components, and thus could not be used to support the definition of different requirements either. Even if the equipment was decomposed into further parts than what was modelled in the PSA, the same importance was assigned to the equipment that was assessed in the PSA for the entire equipment.

Due to the fact that the development of PSA for a new NPP was made in parallel with the evolution of plant design, it was observed in the Basic Design phase PSA that the identifiers (IDs) and the denomination of the single model elements that were used in the PSA were not in full compliance with the alphanumeric identifiers and commonly used denomination of the technical components specified in the final version of the corresponding official technical and design documents. Consequently, assignment of the following attributes to the particular component IDs of the PSA was made to ensure an adequate level of compliance with the design, thus enhance the applicability of the PSA:

- "KKS" coding (i.e. codes of Kraftwerks Kennzeichen System – identification system for power plants that is generally used in the Paks II project) to enable the use of the results in the design and licensing;
- Component denomination to facilitate the adequate interpretation of the results.

It shall be noted that the vast majority of the component IDs used in the PSA of the Paks II NPP performed in the Basic Design phase were in partial or in full compliance with the KKS system. However, this compliance was not sufficient; therefore, an extensive review was necessary in this respect to support the current risk-informed application.

If redundant components with an identical role were classified only individually, it would obscure the role of those important aspects that necessitate the use of redundancy, since the individual importance of these components may be low due to the presence of redundancy. By treating redundant components jointly, their combined importance increases, and hence the requirements for the level of detail in their treatment resulted from the classification would change and become stricter. Consequently, redundant pieces of equipment were usually put into the same licensing group, so grouping based on the use of appropriate quantitative measures affected them equally. Therefore, aggregated importance measures were generated for the redundant pieces of equipment subject to the same treatment (requiring the same “care”). When the aggregated measures were calculated, the failures to be considered included also the common cause failures within the relevant equipment group.

4.3. Analysis of Risk Significance for Equipment

In this step, the contribution of each equipment failure to the total plant risk was examined, the ratio of failure relative to the actual risk value was assessed, and the sensitivity of risk to changes in the probability of equipment failure was evaluated. Finally, the risk significance of the equipment was reviewed by considering the related safety function and the risk significance of the equipment considered critical to fulfill the given function.

4.3.1. Criteria

PSA importance measures can be used to assess risk (probability-based) importance. These metrics place the equipment importance on a continuous scale. However, for practical use, it is more appropriate to define a limited number of categories (groups), similarly to the deterministic classification. Importance measures that were calculated for the equipment are:

- fractional contribution (FC);
- risk increase factor (RIF).

For this PSA application, these measures were determined by the use of the PSA model for the equipment as a whole (and, in case of redundant pieces of equipment, for the equipment group).

To facilitate the use of risk information in sufficient detail for this application, and in view of the fact that Hungary, unlike some other countries (e.g. the US), applies four deterministic safety classes, three levels of risk importance (as in Finnish [19] and Ukrainian [20] practice) were distinguished using the threshold values of FC = 0.005 and RIF = 2:

- Equipment is of High Risk Significance, if
  - its fractional contribution is higher than 0.005 (regardless of the value of its risk increase factor).
- Equipment is of Medium Risk Significance, if
  - its fractional contribution does not exceed 0.005, and
  - its risk increase factor is higher than 2.
- Equipment is of Low Risk Significance, if
  - its fractional contribution does not exceed 0.005, and
  - its risk increase factor does not exceed 2.

As there are four deterministic safety classes, defining three risk significance levels instead of two provided better and clearer support for risk communication of the role of SSCs in safety. This approach, i.e. the use of three classes of safety significance had previously been tested on selected systems of the operating Paks NPP within the framework of a trial application of risk-informed safety classification of SSCs.

Risk significance levels were also assessed for initiating events. Only the fractional contribution was applicable (quantified) for initiating events because the risk increase factor is not applicable to frequency-based model elements. Consequently, the risk importance of initiating events can only be high or low. If a piece of equipment not only plays a role in accident mitigation but can also lead to an initiating event, then the fractional contribution of the equipment was calculated by aggregating the fractional contribution of its mitigation function and of the relevant initiating event(s) (considering its contribution to the occurrence frequency of the initiating event(s)) to establishing a basis for the final classification.

4.3.2. Radiological sources, initiating events, plant operational states and PSA levels

The importance of equipment may vary significantly for the different risk contributors (i.e. radioactivity sources, initiating event groups and plant operational states) and for the different levels of PSA (i.e. core/fuel damage risk, risk of large or early release). In general, the PSA used for decision-making should be as realistic as possible. However, conservative modelling choices and assumptions are often used in order to focus analytical resources on the most important scenarios. It is essential to recognize that employing any conservatism and unrealistic assumptions can bias the results, which can have manifold effects on the decision. As such, the effects of conservative modelling choices with paramount influence in PSA (i.e. those that can potentially influence the decision) should be clearly understood and communicated to adequately support the definition of risk-informed licensing groups. Conservatism in PSAs can generally be described in terms of degree of realism, and the level of detail and precision in a PSA.

For example, if the results are dominated by seismic risk due to high conservatism in the seismic PSA compared to internal events or internal hazards PSA, then the risk significance of equipment playing a significant role in the seismic risk may be overestimated, and other failure events and the associated equipment having low contribution to the seismic risk may be underestimated. In this case, the aggregated risk results may be biased due to the degree of conservatism and level of detail of the seismic PSA. On the other hand, if equipment importance is high (exceeding the thresholds) only for shutdown states or for a certain internal hazard, and risk significance is assigned only on the basis of the aggregated risk (originated from all radiological sources, initiating events and plant operational states), then the use of aggregated risk measures can hinder insights that can be revealed only by looking at risk significance relative to the different risk contributors. Lastly, it is not considered appropriate either if a radiological source, initiating event group or plant operational state dominates the overall risk results, and, consequently, the importance of the equipment playing a role in the risk from other radiological sources, initiating event groups or plant operational states does not show up in the overall risk. Therefore, equipment importance was calculated separately for each of the following risk contributors:

- radiological sources:
  - reactor;
  - spent fuel pool;
- initiating event groups:
  - internal initiating events;
  - internal fires;
  - internal flooding;
  - earthquake;
  - other external hazards;
- plant operational states:
  - full power operation;
  - low power and shutdown states.

The three types of risk contributors above are independent dimensions; therefore, separate results can be generated for the meaningful combinations of all radiological sources, initiating event groups and plant operational states for PSA level 1 and level 2.

4.3.3. Results for the main risk contributors and aggregated results

The level of maturity and detail, and realism in the analysis of the different risk contributors were analyzed and evaluated in order to select those PSA scope attributes (risk contributors) that should be the drivers of assigning the level of risk significance to the equipment. The main objective was to ensure that the use of the proposed table will enable adequate prequalification, and the results are not biased due to differences in the level of conservatism and level of detail in the assessment of the main risk contributors. It was concluded that the internal and external hazards are analyzed more conservatively than the internal initiating events, so the measures of significance coming from the analysis of internal and external hazards were not used automatically for the overall classification of the equipment. Therefore, these results had to be evaluated on a case-by-case basis to examine and decide whether the prequalification needed modifications or not.

For each piece of equipment, the results were obtained for the different risk contributors separately as illustrated in Table 1. If the measures of equipment significance in the cells marked in grey were not the same, then the highest significance from among the grey cells was assigned to the equipment in question.

Table 1. General Table for Presenting Risk Contributor Specific and Aggregated Results

	Reactor, full power	**Reactor, shutdown**	**Reactor, all POSs**	**Spent fuel pool, all POSs**	**Level 2**
Internal events					
Internal fire					
Internal flooding					
Earthquake					
Other external hazards					
Summary	———	———			

= The calculated importance is assigned to the equipment.

= The calculated importance is not assigned to the equipment, but it is retained for use during the interpretation of results.

——— = Importance does not need to be determined.

4.3.4. Sensitivity of significance results to certain model parameters

In this step of the significance analysis, it was examined whether any of the assumptions or estimates obtained from the plant PSA that were generally considered as most uncertain by the analysts, obscured or biased the real importance of certain equipment or not. This was done by performing sensitivity analysis in which changes were made to the values of certain parameters (including probability of human errors and common cause failures) in the PSA model and equipment importance was recalculated by using the modified model. The results were examined to determine if any of the equipment showed up more important than in the original importance analysis (especially if the equipment was originally assigned low risk significance). The analysis was performed separately for each radiological source, PSA level, initiating event group and plant operational state.

4.3.5. Modification of risk significance classification by considering related system functions

In this step, the risk significance classification was extended from components classified higher to “similar” components classified lower. Similar components were interpreted in this context as components that may mitigate the fulfilment of the same system functions. In the first step, the relevant system functions were identified. Subsequently, all the equipment that was critical to the given function was listed. If the similar components had a critical role in ensuring exactly the same functions, then the higher risk significance was extended to the similar component(s). Otherwise, the risk significance was not extended.

4.4. Review by an Expert Group

Classification was not only a mechanistic application of the above criteria and procedure but it was also subject to review. The analysis was carried out by a group of carefully selected experts. The role of the expert group was to ensure that all the important aspects of design and qualification were considered in the final classification. Besides reviewing the completed prequalification and the risk significance classification of the equipment included in the PSA model, the expert group had to classify the risk significance of all those components that were not modelled in the PSA.

The expert group first reviewed and verified the licensing groups according to the prescribed criteria of prequalification. Group members requested requalification of some equipment even before performing further review tasks, when they considered that the prequalification had not been performed correctly or it had not been justified fully.

Furthermore, the key task of the expert group was to complement the quantitative analysis with their own knowledge (in relation to, e.g. design, enforcing the principle of defense in depth, etc.) that falls beyond the limitations of PSA, even for the equipment unambiguously classified on the basis of PSA calculations. The expert group could change the PSA-based classification upwards, i.e. they could reclassify equipment into a higher significance level compared to the PSA results, but the group could not relax the PSA-based classification. Some exemplary issues that had to be considered for each piece of equipment are as follows:

- Does the equipment have a role in protecting the personnel from radiation doses beyond the predefined threshold?
- Does the equipment have a role in the prevention of activity release from a non-severe accident (e.g. waste management)?
- Can failure of the equipment lead directly to an initiating event (in any operational state) including those that have either been screened out from PSA due to their low occurrence frequency or are out of the scope of PSA?

Given the large number of equipment requiring risk significance classification and not modelled in the PSA, some general rules were established to facilitate a graded approach. First, several characteristic equipment groups were identified based on relevant component features related to risk significance. This allowed for the determination of the risk significance of all elements within a group based on common criteria. Equipment that could not be classified using these group characteristics were subject to a thorough individual evaluation.

4.5. Classification into Risk-informed Licensing Groups (RILGs)

The work of the expert group resulted in a final risk significance of all the equipment which could be low, medium or high. The equipment was then assigned to risk-informed licensing groups (RILGs), in particular RILG 1 (notification obligation) and RILG 2 (briefing obligation), that take into account both deterministic and probabilistic considerations as shown in Table 2.

Table 2. General Table for Presenting Risk Contributor Specific and Aggregated Results

	Deterministic safety class	
Risk significance	2	3
High	RILG 1	RILG 1
Medium	RILG 1	RILG 2
Low	RILG 2	RILG 2

The equipment that deserves less attention on the basis of the probabilistic results compared to the deterministically driven classification can be found below the shaded area in the column of deterministic safety class 2. The licensing requirements for such equipment were relaxed. The equipment that deserves more attention on the basis of the probabilistic results compared to the deterministically driven classification can be found above the shaded area in the column of deterministic safety class 3. The licensing requirements for such equipment were tightened. Consequently, notification obligation was assigned to those components that were included either in deterministic safety class 2 and their risk significance was high or medium, or in deterministic safety class 3 and their risk significance was high. Briefing obligation was assigned to those components that were included either in deterministic safety class 2 and their risk significance was low, or in deterministic safety class 3 and their risk significance was medium or low.

4.6. Presentation of Results

The classification procedure and the work of the expert group were documented in tabular form in such level of detail that it can be understood and repeated later without the involvement of or interview with the participants of the whole process. The results obtained from PSA, namely the importance measures and the classification based on them, were collected (see Table 1). It is not practical however, to build such kind of tables for each and every component. Instead, a single large table (in a spreadsheet) was developed that summarized all relevant information for all components. Each row represents one component, and the information about the different analysis steps is given in the different columns.

4.7. Modification of Requirements and Approval

The methodology that was intended to be used for risk-informed definition of licensing groups was submitted to the authority for information and unofficial/preliminary approval. Thus the methodology document for risk-informing the definition of licensing groups was unofficially/preliminarily approved by the authority before its application. Risk-informed licensing groups (RILG) were assigned for all the equipment analyzed, and different requirements were specified to the pieces of equipment from licensing point of view, i.e. notification obligation, or briefing obligation. The results of risk-informed definition of licensing groups were originally submitted for unofficial/preliminary review, and they were officially submitted for review and approval after the amendments to the Hungarian nuclear safety regulations had been enforced.

5. RESULTS AND FINDINGS

Prequalification was performed for all equipment that, according to the current version of the so-called Owner’s Technical Database, belongs to deterministic safety classes 2 or 3 and is included in the PSA model. The expert group reviewed the completed prequalification and determined the risk significance of all the components that were not modelled in the PSA. The components were then assigned to risk-informed licensing groups. As a result, 1929 components were assigned to risk-informed licensing group 1, most of them based on prequalification. Notification obligation applies to them.

During the risk-based prequalification, requalification of the risk-informed licensing group was found necessary in the case of 8 components because of the importance of the corresponding initiating events, and in case of 31 components because of the extension of risk significance through system functions. In addition to random failures, risk importance measures were also quantified and presented in separate spreadsheets for fire- and seismic-induced equipment failures. Due to the low risk significance of fire-induced hot shorts, no further investigation proved necessary for the fire resistance of equipment. According to the results obtained for seismic-induced failures, notification obligation applies to the seismic resistance of 11 equipment groups which should be demonstrated by one representative component of each of these groups. Finally, risk importance measures are also given for internal initiating events in a separate spreadsheet. It can be observed that each secondary side pipeline playing a role in any of the pipeline break-related initiating events has high risk significance, hence notification obligation applies to them.

6. CONCLUSIONS

According to one of the recent amendments to the Hungarian nuclear safety regulations, risk insights must be considered to specify the licensing requirements for manufacturing and procurement of systems, structures and components (SSCs) of deterministic safety classes 2 and 3 of a new nuclear power plant. This approach allows the licensee to differentiate in the detail of the information to be submitted to the nuclear safety authority, although the documentation of the licensing process by the licensee is practically the same for the different categories of SSCs. Irrespective of the decision on notification obligation versus briefing obligation, the nuclear safety authority can perform a review of the full scope licensing documentation for any components, including those that are originally subject to briefing obligation. First, a methodological document was prepared for the grouping of equipment for licensing purposes with the integrated use of risk information and other safety considerations for the planned Paks II Nuclear Power Plant so that compliance with the Hungarian nuclear regulatory requirements is ensured. In accordance with the predefined work plan, prequalification was carried out for all the components that belong to deterministic safety classes 2 and 3, and are included in the PSA model of the plant. The prequalification was thoroughly reviewed by a panel of experts. Based on the review findings, the prequalification was repeated. The expert panel assigned risk-informed licensing groups to all SSCs outside the scope of the PSA model. As a result, it was possible to determine whether an SSC was subject to notification obligation or briefing obligation.

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