IFE/E-2018/001

# Learning from successful operations in nuclear power plants - a guideline

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Client:

Title: Learning from successful operations in nuclear power plants - a guideline


Summary:

This report contains a guideline for learning from successful operational experiences in nuclear power plants. The suggested approach is systems-oriented in nature.

The initial part of the guideline introduces the definition of success used in the report, discusses the benefits of learning from successes and outlines how learning from successes requires a different analysis approach than learning from failures. This is followed by a description of the seven principles for learning from successes on which the methodology in the guideline was developed:

- Learning from successes should be supported by the organizational culture.
- Successes may be perceived differently from one person to the next.
- Successes may be embedded in a chain of events that has no successful outcome.
- Successes may have different learning potentials.
- Success is sometimes a result of non-permanent factors.
- Pseudo-success may lead to complacency and drift.
- Implementation of lessons learned should be guided by a systemic approach.

The main part of the guideline contains step-by-step guidance on how to capture and analyze successes. It is structured in five parts:

(1) Capturing potential successes
(2) Screen for learning potential
(3) Analyze - local stakeholder perspective. The section refers to analyses carried out within the local organizational unit, who experienced the success.
(4) Analyze - joint stakeholder group perspective. This section refers to analyses carried out jointly by all organizational units, who may be directly or indirectly impacted by the success and/or by how the success was achieved.
(5) Implement the lessons learned from the actual success.



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# Preface

Collecting and sharing good practices within and between nuclear power plants (NPPs) are encouraged by IAEA and WANO. A study conducted in two Nordic NPPs in 2016, however, showed that lessons learned from successes were addressed in significantly less systematic ways than lessons learned from adverse events (Viitanen et al., 2016).

This report offers a guideline aimed at supporting a systematic way of collecting and learning from successful operational experiences in NPPs. The guideline has been developed based on findings in three projects initiated by Vattenfall Ringhals AB, Sweden: Nordic Nuclear Safety Research's project entitled "Learning from Successes in Nuclear Power Plant Operation to Enhance Organisational Resilience" (LESUN) and two subsequent projects financed by Vattenfall Ringhals AB and The Finnish Research Programme on Nuclear Power Plant Safety (SAFIR). All of these projects were carried out as a collaboration between VTT Technical Research Centre of Finland, the Institute for Energy Technology, Norway and Vattenfall Ringhals AB. Earlier findings from the projects have been documented in the following report and papers: Viitanen et al. (2016a), Viitanen et al. (2016b), Skjerve et al. (2017), Viitanen et al. (2017).

The guideline on how to learn from successful operations in nuclear power plants is contained in the Appendix.

The guideline was designed to be printed out and used as a guidance document. It includes a definition of success and the set of principles for how to learn from successes. The guideline is generic in nature and intended to be adapted to local plant practices. It has been reviewed and adjusted based on feedback from nuclear power plant staff that were not involved in any of the projects.

Who may benefit from reading the guideline? The guideline may be useful to people who want to learn more about how to analyse successful operational events. It may be useful to people engaged in or about to be engaged in integrated analyses of successes by large groups of people organised in several stakeholder groups. Finally, it may be useful to people who simply want to increase their awareness of all the successful occurrences encountered during everyday work in a nuclear power plant.

Even though the guideline was developed with reference to the nuclear power plant domain, we believe that the framework can be adapted to other safety-critical operational areas as well.

We hope the guideline contributes to increase a growing holistic perspective on systematic learning from successful operational occurrences.

Halden, 21 November 2018
Ann Britt Skjerve, Kaupo Viitanen, Hanna Koskinen, Marja Liinasuo and Christer Axelsson

## References

Skjerve, A.B., Viitanen, K., Axelsson, C., Bisio, R., Koskinen, H. and Liinasuo, M. (2017). Learning from Successes in Nuclear Operations - A Guideline. In: Marko Čepin and Radim Briš (Eds.). Safety and Reliability – Theory and Applications. CRC Press Taylor & Francis Group 6000 Broken Sound Parkway NW, Suite 300 Boca Raton, FL 33487-2742 CRC Press 2017.

Viitanen, K., Bisio, R., Axelsson, C., Koskinen, H., Liinasuo, M., and Skjerve, A.B. (2016a). Learning from Successes in Nuclear Power Plant Operation - Intermediate Report from the NKS-R LESUN. NKS-354. Roskilde, Denmark: Nordic nuclear safety research. Available at: http://www.nks.org/scripts/getdocument.php?file=111010213330253

Viitanen, K., Koskinen, H., Axelsson, C., Bisio, R., Liinasuo, M., Skjerve, A.B. (2016b). Learning from successful experiences: An undeveloped potential in the nuclear industry? Paper presented at the Enlarged Halden Programme Group Meeting, 2016.

Viitanen, K., Koskinen, H., Skjerve, A.B., Axelsson, C., Liinasuo, M., Bisio, R. (2017). Modelling Organizational Learning from Successes in the Nuclear Industry – Staff Meetings as Forums of Knowledge Sharing and Acquisition. Paper presented at the 7th REA Symposium 26th-29th June 2017.

## Appendix

We recommend that you print-out the guideline, beginning from the following page, as a stand-alone document in colour.

# Learning from successful operations in nuclear power plants - a guideline

2017/ 18
IFE/ E-2018/ 001

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# Introduction

Collecting and sharing good practices within and between nuclear power plants (NPPs) are encouraged by IAEA and WANO. A recent study conducted in two Nordic NPPs, however, showed that lessons learned from successes were addressed in significantly less systematic ways than lessons learned from adverse events (Viitanen et al., 2016). The purpose of this guideline is to promote a systematic way of collecting and learning from successful operational experiences in NPPs. The guideline is generic in nature. It is intended to be adapted to local plant practices and to the specific purpose that triggers its use: The guideline may be read by an individual simply to learn more about how to analyse successes; It may be used to support and integrated analyses of successes by large groups; It may be used as a means to increase awareness of successful occurrences during everyday work, etc.

The present guideline was developed based on the findings from the research study "Learning from Successes in Nuclear Power Plant Operations to Enhance Organisational Resilience" as a collaboration between IFE Institute for Energy Technology, VTT Technical Research Centre of Finland Ltd and Ringhals AB. LESUN was financed by Ringhals AB, Finnish Research Programme on Nuclear Power Plant Safety SAFIR2018 and Nordic Nuclear Safety Research NKS. It has been exposed to and revised based on three user tests by NPP personnel. The tests covered steps 1-3 of the guideline.

Before going into more detail of the guideline, we will briefly address why we believe it is important to learn from successes and why a dedicated guideline on how to learn from successes is necessary. If you are not interested in these topics, but rather wants to get started with an analysis immediately, go to the step-by-step part of the guideline on next page.

## What is success?

To work systematically with successes, it is helpful to develop common ground about what a success implies. One way of defining success can be to decompose it into a set of categories. The following three categories may be applied (Viitanen et al., 2016):

- Normal successes: routine daily work where nothing special appears to happen and success is expected
- Extraordinary successes: performing better than expected; creating or improving systems and processes, or exploiting unexpected favourable conditions to reach more than expected
- Recovery successes: situations in which performance of operational activities (e.g. based on problem-solving) return the plant to the expected state after a disturbance or anomaly.

The three categories may both comprise successes that boost both efficiency and safety. However, in a NPP safety concerns will always be given the highest priority.

## What are the benefits of learning from successes?

Learning from successes and learning from adverse events share the same goal: they aim at contributing to the basis for making operation safer and/or more efficient. Lessons learned from successes constitute insights into solutions that have been found to work well. These insights may proactively contribute to strengthen the robustness of operation and thus increase the likelihood for successes in future settings. Focusing on how personnel contribute to create success will make successes more salient to personnel. For this reason, lessons learned that would otherwise not have been brought forward, are more readily harvested. Deliberately focusing on successes and on how the successes were created may also impact operation more directly: it may help reduce the risk for complacency in situations where everything-progresses-as-normal since staff members will be encouraged to continuously uphold a questioning attitude to capture potential successes.

## Why a guideline to learn from successes?

The guideline is developed based on the position that we do not learn from successes in a similar way as we learn from failures. Overall, analyses of successes and analyses of failures can be expected to involve similar steps, such as capturing occurrences, screening occurrences and clarifying the steps involved in creating an occurrence. However, the emphasis and directions of analyses of successes and failures will differ, and this is the reason why separate guidance materials are useful to promote systematic learning from successes.

## How does learning from failures and successes differ from each other?

In a NPP, failures are unexpected. They are often – but not always – attention-catching. Failures have negative consequences and tend to imply a disruption or a discontinuation of a task performance process. They may constitute, e.g. tools falling to the shop floor, unexpected high temperatures or levels in tanks, explosions, or other types of deviations, incidents or accidents. Typically, failures imply that threshold values have been exceeded and/or that the operating procedures have not been adhered to. These characteristics imply that personnel tend to rather readily agree if a failure has occurred or not. In analyses of failures, then, very limited time is spent on clarifying if the occurrence addressed is indeed a failure. The main part of the analysis will seek to clarify how to prevent a similar event from occurring in future settings, searching for effective safety barriers.

Successes, on the other hand, are often - but not always – expected occurrences that do not readily stand out in any way. They tend to imply a continuation of planned task-performance processes, implying that threshold values have been maintained and operating procedures adhered to. In this sense, normal operation may be seen as consisting of series of successes. The same is true when a failure is recovered based on adherence to the operating procedures. In some cases, successes may also be extraordinary, implying that task performance was better than expected, e.g., because new and smart strategies and/or new tools were applied to solve a problem. Still, because successes tend to imply that work proceeds as planned, it may be significantly more challenging to notice successes than failures. It may also be more challenging to understand if an occurrence that appears to be successful might actually have unnoticed negative consequences on safety or efficiency that will increase the risk for unwanted occurrences in the future. For this reason, the main part of an analysis of success will aim at clarifying if the occurrence addressed is indeed a success: an analysis will challenge the success from various perspectives to assess challenge its robustness, to understand if and under what exact conditions, the success may be repeated. Only to a more limited degree will the analysis address how to re-create similar successes in future setting: The answer to this question should largely be implied when understanding how the success was created.

Overall, the number of successes that occurs in a mature organisation will markedly outweigh the number of failures. To prevent extensive analysis of successes that does not produce new insights, it is of key importance to efficiently screen successes for their learning potential prior to initiating a more in-depth analysis process.

# Principles for learning from successes

## The content of the guideline is based on seven principles about how to promote learning from successes in a NPP context

### 1. Learning from successes should be supported by the organisational culture.

The traditionally strong emphasis on learning from failures in NPPs may make it easier for personnel to recognize failures than successes. Just as raising topics about failures and near-misses can be sensitive to personnel (e.g. associated with blaming), it can also be sensitive to raise topics about successes (e.g. conceived as bragging). However, a success should be considered as something of benefit to all. To promote capturing of successes, it is important to create an organizational culture that supports sharing and learning from successes.

### 2. Successes may be perceived differently from one person to the next.

It is important to keep in mind that personnel within an organization do not always agree on what constitutes a success. People may have different perspectives and different concerns, for example depending on their responsibilities and personal preferences: one person may see a solution as a successful innovation, allowing him or her to perform a task more efficiently than before, whereas another may see the solution as less successful or perhaps even as undesirable. For this reason, when a success is brought forward to a more in-depth analysis it must always be considered as a "potential success". Other stakeholders will have to co-assess the "potential success" before it might be defined as a systemic success.

### 3. Successes may be embedded in a chain of events that has no successful outcome.

Successes are most readily captured when they are reflected in the outcome of a chain of events, i.e., when a task is successfully completed. However, even if a task-performance sequence does not have a successful outcome, success may still be present in relation to one or more parts of the specific task-performance sequences, e.g. in relation to identification, understanding, decision-making, and/or implementation. For this reason, capturing and analysing successes may require a finer-grained analysis of event chains.

### 4. Successes may have different learning potentials.

To avoid data overload, it is necessary to initially screen successes to determine which successes to analyse in-depth: In some cases, the factors behind a success will already be well understood, and the learning potential associated with the success is thus limited. In other cases, the success may be achieved under unusual conditions and/or be surprising to personnel, and the learning potential may be high.

### 5. Success is sometimes a result of non-permanent factors.

It cannot be taken for granted that a chain of events, having led to a success in one case will also be successful if repeated in future settings. For this reason, a basic analysis of successes should cover two perspectives: First, the functions or basic actions that are always required to solve the task successfully should be clarified. Second, the impact of factors particular or incidental to the situation on creating the success should be identified. Such factors could be e.g. the competence of the particular staff members, availability of particular tools, etc. If the analysis shows that a success was created based on factors particular to the situation, it cannot be expected that the success will repeat itself in the future, even if the exact same actions leading to the success are repeated.

### 6. Pseudo-success may lead to complacency and drift.

It should be clarified if the ways in which a success was achieved may lead to increased risk for failures in the future. If this is the case, the success is not sustainable and should be considered as a pseudo-success – and possibly further analysed from the perspective of failures. Unsustainable ways of achieving successes may imply the usage of short cuts, the usage of tools and equipment in different ways than intended, etc.

### 7. Implementation of lessons learned should be guided by a systemic approach.

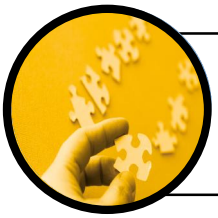
A set of lessons learned derived from many different successes may not necessarily be compatible. There is a risk that implementing one lessons learned may come to reduce the expected positive impact of another lessons learned. For this reason, decisions about what lessoned learned to implement should be based on a systemic approach, i.e. from the perspective of how the organisation overall may most efficiently achieve its goals, to guard against the risk for sub-optimization in different parts of the organisation.

# Step-by-Step Guidance

## Capture potential successes

1.

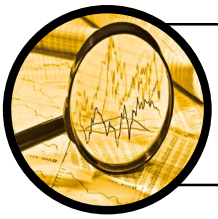
Operational successes may happen at any time in a NPP. Sometimes successes will be easily recognizable and sometimes more elusive.



## Screen for learning potential

2.

To determine the learning potential of a success, it should initially to be assessed if the successful occurrence or sequence of activities may give rise to lessons learned that are new and useful to the organisation.



## Analyse -local stakeholder group's perspective

3.

To determine if the potential success is an actual success, the potential success should be challenged and a local stakeholder analysis of the potential success should be carried out by all the identified workgroups a ected by the success.

## Overview of the analysis process

The overall approach to analysing successes involves five steps: capturing, screening for learning potential, an analysis phase comprising two steps: analysis from a local stakeholder group's perspective and analysis from a joint stakeholder group perspective, and finally implementing lessons learned from success (see above short introduction of the five steps)

These five steps should be adapted to the local practices for lessons-learned analysis applied at your plant.

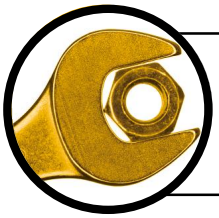
In the following pages of this step-by-step guideline the five steps and related questions are gone through in more detail and you may explore and find out how to learn from success.

# Success


Analyse -joint stakeholder group perspective

4.

We recommend that all stakeholders jointly assess the potential success. The purpose of this assessment is to challenge the potential success from a systemic view, i.e., from the perspective of the organisation's ability to achieve its overall goal.



Implement lessons learned from actual successes

5.

Lessons learned from successes should be prioritised and implemented according to the practices at the plant. The lessons learned may constitute, e.g. new tools, sharing of particular knowledge, adjustment of work practices, etc.

# Analysing successes

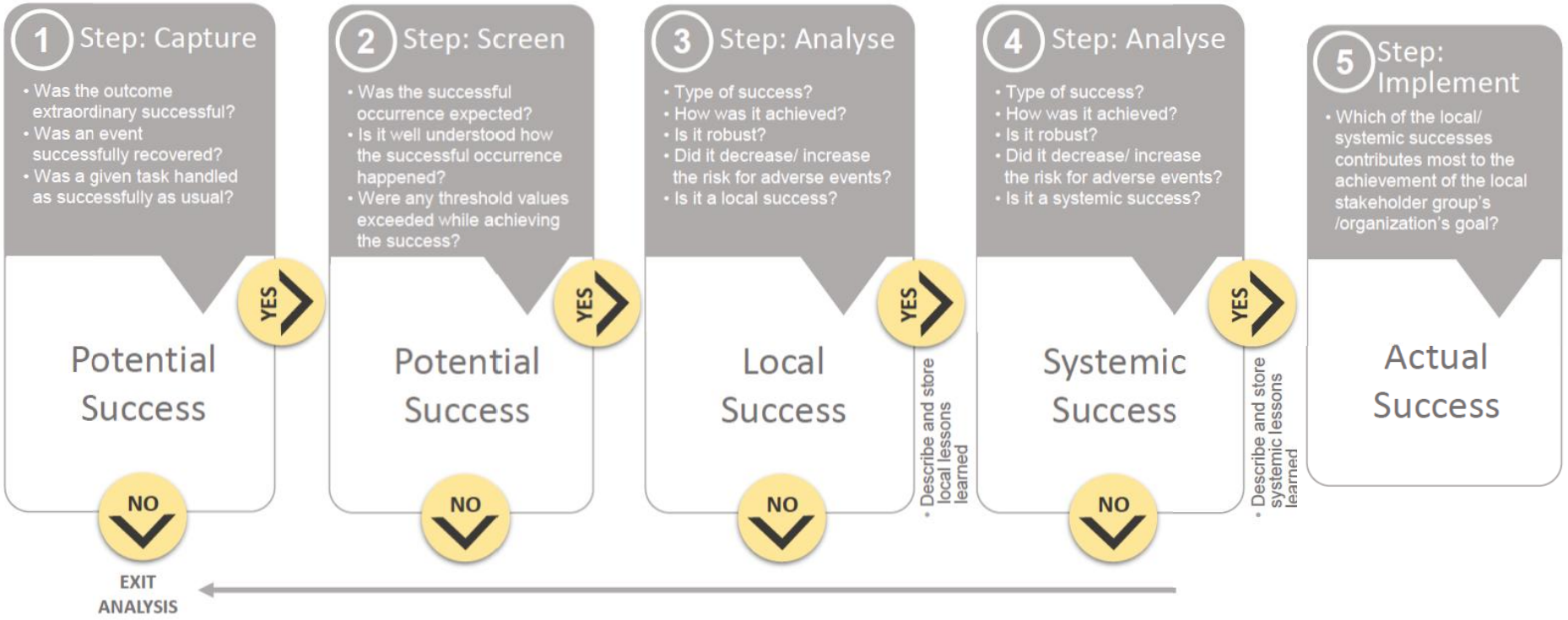



**Figure: Overview of the suggested approach for analysing successes.**

A summary of the analysis process is provided in above . The summary shows the five steps of analysing successes as was presented in the first spread, but in more details. It includes a shortened version of the questions to be addressed when analysing successes. The analysis process is described in detail following pages.

# Step 1: Capture a potential success

Operational successes may happen at any time in a NPP. Plant personnel should be encouraged to bring forward own as well as others' successes. The successes may constitute particular occurrences or even longer sequences of events (e.g. a task-performance process or a project of some kind). Sometimes successes will be easily recognizable and sometimes more elusive. The latter may, e.g., be the case when successes are interwoven in long chains of events containing multiple interactions.


To identify a success, key questions to be asked to an occurrence or sequence of activities include:

- Was the outcome extraordinarily successful?
- Was an event successfully recovered?
- Was task handled successfully as always?

- STEP 1.1: PLEASE DESCRIBE THE EVENT YOU CONSIDER TO BE A SUCCESS IN A WAY WHICH ALLOWS OPERATIONAL STAFF TO UNDERSTAND WHAT HAPPENED:

- STEP 1.2: PLEASE DESCRIBE WHY YOU THINK THE EVENT WAS A SUCCESS:

# Step 2: Screen for learning potential

To determine the learning potential of a success, it should initially to be assessed if the successful occurrence or sequence of activities may give rise to lessons learned that are new and useful to the organisation. Below are some important questions to address in this process. There may be other questions as well. The judgement of whether a learning potential exists will be based on the analyst's overall assessment of the joint answers provided to these questions.


Key questions to ask to clarify learning potential include:

- STEP 2.1: IS IT ALREADY WELL-KNOWN IN THE ORGANISATION, E.G., IMPLEMENTED IN INSTRUCTIONS OR REFLECTED IN CURRENT WORK PRACTICES, HOW THE SUCCESS WAS ACHIEVED? PLEASE DESCRIBE.

If the answer is no or not entirely, the chances that a learning potential exists is increased.

- STEP 2.2: DO YOU THINK THAT THE SUCCESS HAPPENED BY CHANCE: WAS THE SUCCESS A RESULT OF INCIDENTAL PRESENCE OF SUCCESS-PROMOTING FACTORS UNIQUE TO THE PARTICULAR SITUATION? PLEASE DESCRIBE.

- STEP 2.3: CLARIFY WHETHER THE THRESHOLD VALUES OF PLANT PROCESSES / COMPONENTS WERE EXCEEDED WHILE ACHIEVING THE SUCCESS? PLEASE DESCRIBE.

**Note:** Even if one or both of the two aside questions are answered confirmatory, the learning potential may still be high. However, this case, the analysis process should explicitly address the impact of the exceeded thresholds values and/or violated procedure parts on safety.

- STEP 2.4: CLARIFY WHETHER PROCEDURES / ROUTINES WERE VIOLATED WHILE ACHIEVING THE SUCCESS? PLEASE DESCRIBE.

- STEP 2.5: SUMMARISING WHAT IS KNOWN ABOUT THE POTENTIAL SUCCESS: IF THIS SITUATION SHOULD HAPPEN AGAIN, WOULD YOU WANT PERSONNEL TO RESPOND AS THEY DID IN THIS SPECIFIC CASE? (IF NOT, THERE MAY BE NO NEED TO ANALYSE THE EVENT FURTHER FROM A SUCCESS PERSPECTIVE)

If “yes”, the chances that a learning potential exists is increased

☐ Yes. ☐ No.

- STEP 2.6: BASED ON YOUR INSIGHTS AT THIS STAGE OF THE ANALYSIS, DO YOU FIND THAT FURTHER ANALYSIS OF THE SUCCESS MAY GIVE RISE TO LESSONS LEARNED THAT ARE NEW TO THE ORGANISATION?

If yes, proceed to step 3, otherwise exit the analysis.

☐ Yes. ☐ No.

- DESCRIBE THE BASIS FOR YOUR DECISION: WHY DO YOU FIND USEFUL TO CONTINUE THE ANALYSIS – WHAT MIGHT WE LEARN? ALTERNATIVELY, WHY SHOULD WE STOP THE ANALYSIS HERE? ANY OTHER KEY INFORMATION TO ADD TO EXPLAIN YOUR ASSESSMENT?

# Step 3: Analyse – local stakeholder group's perspective

The success identified in step 2 will at this stage in the analysis still be conceptualised as a potential success. The reason is that further analyses may reveal aspects of the success or how it was achieved that may have implications that from the overall perspective of the organisation are undesirable.

To determine if the potential success is an actual success, the potential success should be challenged.

One possible approach is outlined here: First, all workgroups that are or may be affected by the success and/or by how the success was achieved should be identified. Each of these workgroups, in the following called local stakeholders, should challenge potential success. Then, each local stakeholder should then analyse the potential success. The outcomes of each local stakeholder's analysis should then be used as a basis for joint assessment of the potential success by all stakeholders. In this way, the likelihood that all relevant aspects of a potential success will be addressed in the analysis process should increase vis-à-vis a situation in which only a joint stakeholder analysis is performed. This helps reduce the risk for, e.g., groupthink and unwanted impact on the analysis of one or more domineering stakeholder(s) representatives.

- STEP 3.1: PLEASE CLASSIFY THE POTENTIAL SUCCESS FROM ALL PERSPECTIVES YOU THINK ARE RELEVANT, AND DOCUMENT ALL NEW INSIGHTS AND IDEAS ABOUT THE SUCCESS THAT EMERGES WHEN CONDUCTING THIS CLASSIFICATION.


Classification of a potential success may contribute to deepen the understanding of the characteristics of the success, because it may promote thinking about the success in new ways. Several classification systems may be applied. One way of classifying success can be to apply the distinctions between normal, extraordinary or recovery success (see page 13 in this guideline [what is a success]). Another, way may be to document in what part of the event chain (e.g., identification, understanding, decision making, implementation and/or the outcome of the occurrence) the success was achieved. Plant-specific ways of classifying successes may also be used instead of or in addition to the suggestions above.

- STEP 3.2: HOW WAS THE POTENTIAL SUCCESS ACHIEVED STEP-BY-STEP?
  PLEASE DESCRIBE, IN A STEPWISE MANNER, HOW THE POTENTIAL SUCCESS WAS ACHIEVED, AS IT IS IMPORTANT TO UNDERSTAND THE DETAILS.

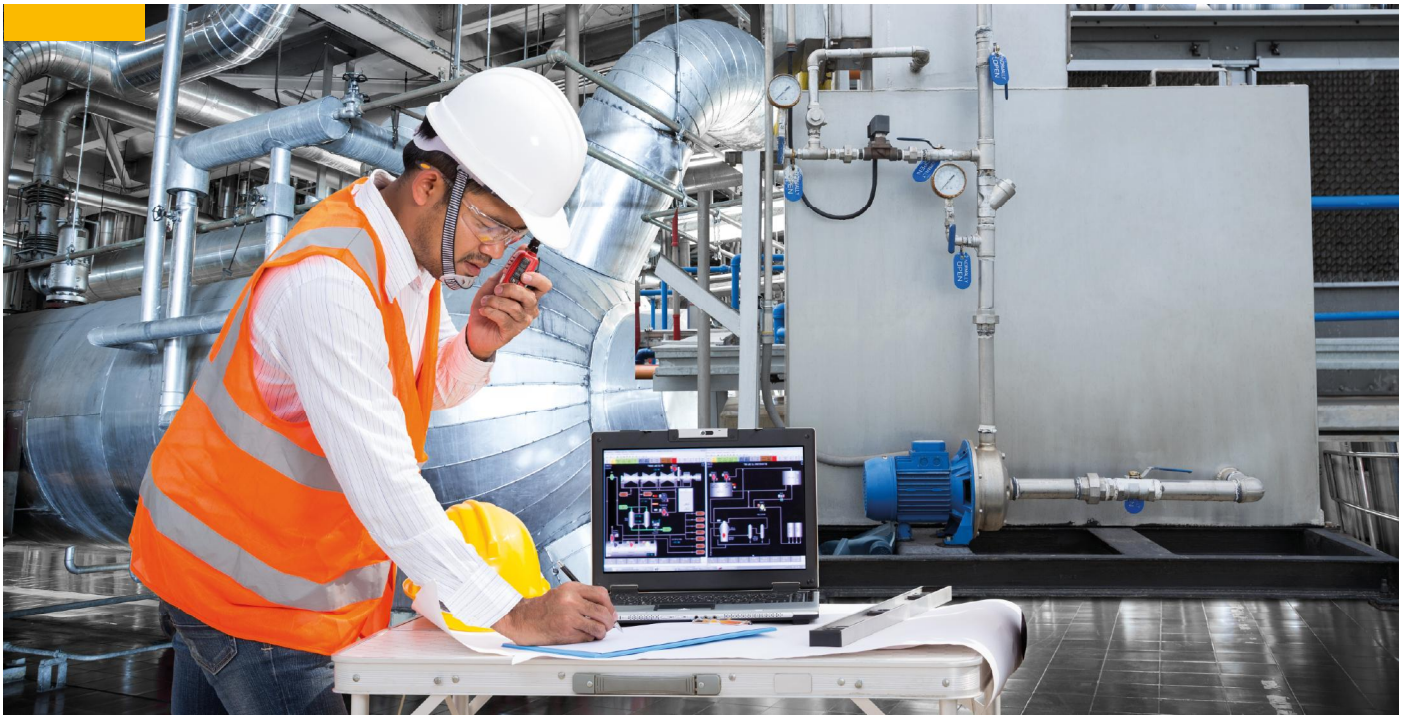
- STEP 3.3: IS THE POTENTIAL SUCCESS ROBUST? CAN THE POTENTIAL SUCCESS BE CONSIDERED " ROBUST" IN THE SENSE THAT IT IS LIKELY TO OCCUR AGAIN, IF THE TASK ADDRESSED IS PERFORMED IN THE SAME MANNER IN FUTURE SETTINGS?
  PLEASE DESCRIBE THE BASIC STEPS NEEDED (IN ALL SITUATIONS) TO SUCCESSFULLY PERFORM THE TASK IN QUESTION:

- STEP 3.3.1: PLEASE DESCRIBE HOW THE PRESENCE OF " INCIDENTAL FACTORS", SUCH AS THE PARTICULAR COMPETENCIES OF A GIVEN TASK PERFORMER, DELAYS, SHORTAGE OF TOOLS, ETC., IMPACT THE ACHIEVEMENT OF THE SUCCESS IN THE SPECIFIC CASE?

- STEP 3.3.2: TO WHAT EXTENT DO YOU ASSESS THAT THE FACTORS CAUSING THE SUCCESS ARE LIKELY TO BE PRESENT ALSO IN FUTURE SETTINGS?

If these factors are not likely to be present, the success cannot be expected to re-occur in future settings, and its robustness would then be limited.

***"This guide is really on the spot - collecting and learning from the positive and safe outcomes of activities"***
Mechanical Maintence Manager



- **STEP 3.4. PLEASE DESCRIBE THE RISKS, IF ANY, THAT COULD ARISE IF THE (POTENTIALLY) SUCCESSFUL PERFORMANCE APPROACH WAS ROUTINELY APPLIED IN THE ORGANISATION:**

Was the potential success achieved in ways that may decrease/increase the risk for adverse events in the future – in terms of safety and/or efficiency? If, e.g., short-cuts were used to achieve the success, consider what implications that could follow if the same short-cuts were routinely applied. Similarly, if tools or other equipment were used in ways that differ from how they are usually applied and/or designed to be applied.

- **STEP 3.5. IS THE POTENTIAL SUCCESS A LOCAL SUCCESS?**

☐ Yes. ☐ No.

Based on an overall assessment of the answer provided to the above questions – and any other questions that may have been raised during the analysis - may be potential success be considered as a local success, i.e., a success from the perspective of the local stakeholder?

- PLEASE DESCRIBE THE BASIS FOR YOUR DECISION. TO THE EXTENT POSSIBLE, THE DESCRIPTION SHOULD INCLUDE BOTH PRO AND CON ARGUMENTS FOR THE DECISION MADE, AS WELL AS HOW THE ARGUMENTS WERE WEIGHTED AGAINST EACH OTHER.

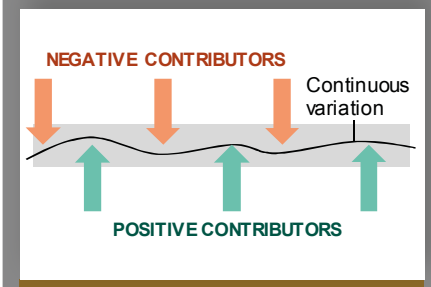
If yes, proceed to step 3.6. If no, exit the analysis.

- STEP 3.6: DESCRIBE THE LESSONS LEARNED FROM THE PERSPECTIVE OF THE LOCAL STAKEHOLDER.

- STEP 3.7: LIST THE RELEVANT STAKEHOLDERS IN THE ORGANISATION WHO MAY BE IMPACTED BY THE (POTENTIAL) SUCCESS OR THE PROCESS LEADING TO THE (POTENTIAL) SUCCESS BY HOW THE SUCCESS WAS ACHIEVED?

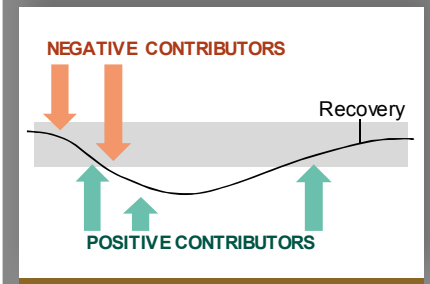
If any other stakeholders can be identified, proceed to step 4. If no other stakeholders can be identified, proceed to step 5.

## Three types of successes



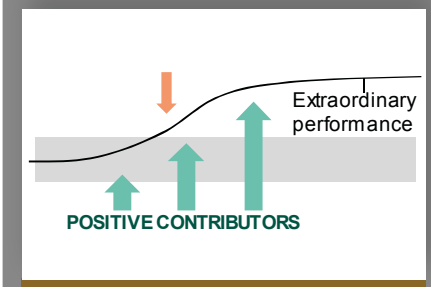

**NORMAL SUCCESSES**

Routine daily work where nothing special appears to happen and success is expected




**RECOVERY SUCCESSES**

Situations in which performance of operational activities (e.g. based on problem-solving) return the plant to the expected state a er a disturbance.




**EXTRAORDINARY SUCCESSES**

Performing better than expected; creating or improving systems and processes, or exploiting unexpected favourable conditions to reach more than expected

# Step 4: Analyse – joint stakeholder group perspective

We recommend that all stakeholders jointly assess the potential success. The purpose of this assessment is to challenge the potential success from a systemic view, i.e., from the perspective of the organisation's ability to achieve its overall goal. Based on the analyses of the individual stakeholders, the analysis may focus at e.g. uncovering interactions and dependencies among the impacts of the success and/or how the success was achieved on the task-performance processes of one or more local stakeholder analyses.

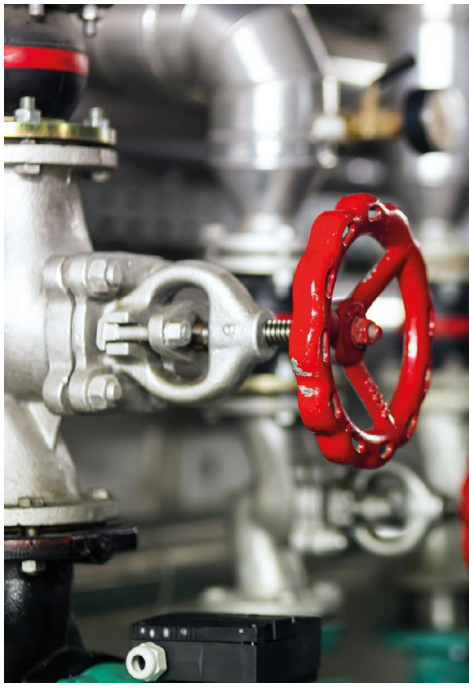
The analysis could be performed by re-running the analysis cycle from step 3 but this time from the joint perspectives of all stakeholders. Below the questions are repeated. For further explanations, see the corresponding descriptions associated with the steps in step 3.

If all agree, that the occurrence was successful, the "potential success" can be considered a "systemic success", based on which lessons learned can be elaborated. If some stakeholders have deviating views these are noted as well.

- STEP 4.1: HOW MAY THE POTENTIAL SUCCESS BE CLASSIFIED?

- STEP 4.2: HOW WAS THE POTENTIAL SUCCESS ACHIEVED?

- STEP 4.3: IS THE POTENTIAL SUCCESS ROBUST?



IEVE

> ***"The systemic approach to the positive factors that builds successes in day-to-day work, is modern safety in practice"***
> **QA Engineer, Nuclear**

- STEP 4.4: DID THE POTENTIAL SUCCESS INCREASE THE RISK FOR ADVERSE EVENTS IN THE FUTURE?

- STEP 4.5: IS THE POTENTIAL SUCCESS A SYSTEMIC SUCCESS?

Based joint stakeholder analysis, assess if the potential success / occurrences addressed can be considered as a systemic success. More concretely: Does the potential success promote the organisations ability to achieve its overall goal?

☐ Yes. ☐ No.

- DESCRIBE THE BASIS FOR YOUR DECISION. TO THE EXTENT POSSIBLE, THE DESCRIPTION SHOULD INCLUDE BOTH PRO AND CON ARGUMENTS FOR THE DECISION MADE, AS WELL AS HOW THE ARGUMENTS WERE WEIGHTED AGAINST EACH OTHER.

If yes, proceed to step 4.6. If no, proceed to step 5.

- STEP 4.6: DESCRIBE THE LESSONS LEARNED FROM THE PERSPECTIVE OF THE JOINT STAKEHOLDERS. DESCRIBE THE SYSTEMIC LESSON(S) LEARNED, INCLUDING PRE- AND POST-CONDITIONS:

# Step 5: Implement lessons learned from successes

Lessons learned from successes should be prioritised and implemented according to the practices at the plant. The lessons learned may constitute, e.g. new tools, sharing of particular knowledge, adjustment of work practices, etc.

When multiple new lessons learned from successes are implemented in an organisation, care should be taken to avoid sub-optimization. It should be assessed if implementing the lessons learned may unintendedly come to work against the impact of implementing the lessons learned based on other successes. If two successes are mutually exclusive, the one which contributes most to the achievement of the organisations' goal should generally be prioritised.
The successes may constitute local successes of concern only to the particular stakeholder or systemic successes of concern for the entire organisation.

In addition, the characteristics associated with the success according to the classification of type of success carried out in step 3.1 may serve as "tags" to facilitate retrieving of past lessons learned in future settings.

- STEP 5.1: IMPLEMENT LOCAL SUCCESSES. PLEASE DOCUMENT THE RATIONALE FOR PRIORITISING OF THE LOCAL LESSONS LEARNED OF CONCERN ONLY TO THE LOCAL STAKEHOLDER. THE DESCRIPTION SHOULD INCLUDE BOTH PRO AND CON ARGUMENTS FOR THE DECISION MADE, AS WELL AS HOW THE ARGUMENTS WERE WEIGHTED AGAINST EACH OTHER.

When multiple new lessons learned from local successes of concern for the individual stakeholder only (cf. step 3.7) are to be implemented, the successes should be prioritized vis-à-vis the overall tasks of the local stakeholder. If the lessons learned are mutually exclusive, the success which contributes most to the ability of the local stakeholder to achieve its overall goal should be prioritised.


WAY
TO
GO!

- STEP 5.2: IMPLEMENT SYSTEMIC SUCCESSES. PLEASE DOCUMENT THE RATIONALE FOR PRIORITISING OF THE SYSTEMIC LESSONS LEARNED. THE DESCRIPTION SHOULD INCLUDE BOTH PRO AND CON ARGUMENTS FOR THE DECISION MADE, AS WELL AS HOW THE ARGUMENTS WERE WEIGHTED AGAINST EACH OTHER.

Systemic successes are successes that benefit the whole organisation overall. When multiple new lessons learned based on systemic successes are to be implemented, the successes should be prioritized vis-à-vis the overall goal of the organisation. If the lessons learned are mutually exclusive, the success which contributes most to the ability of the organisation to achieve its overall goal should be prioritised.

Store the basis for prioritizing the systemic lessons learned according to the practices at your plant.

## Find more information

Viitanen, K., Bisio, R., Axelsson, C., Koskinen, H., Liinasuo, M., and Skjerve, A.B., 2016. Learning from Successes in Nuclear Power Plant Operation - Intermediate Report from the NKS-R LESUN. NKS-354. Roskilde, Denmark: Nordic nuclear safety research.

# Successful operations

Collecting and sharing good practices within and between nuclear power plants (NPPs) is generally encouraged. However, the prevalent way to produce lessons learned is to focus on adverse events. This may result in losing valuable information, which could be useful for advancing efficient and safe operations.

The purpose of this guideline is to promote a systematic way of collecting and learning from successful operational experiences in NPPs. The guideline provides a generic frame that is intended to be adapted to local plant practises and the specific purpose of use that it is applied to. The guideline helps in capturing successes of relevance for learning, and provides analysts with means to identify lessons learned from successes that will increase the likelihood for successful operations in the future."

## Contact and Feedback

The guideline should be perceived as a work in progress. We will be grateful for feedback on your experiences with using the guideline. Please send feedback to Ann Britt Skjerve, e-mail: ann.britt.skjerve@ife.no.