ENISA EFR Framework

Introductory Manual

enisa
European Network
and Information
Security Agency
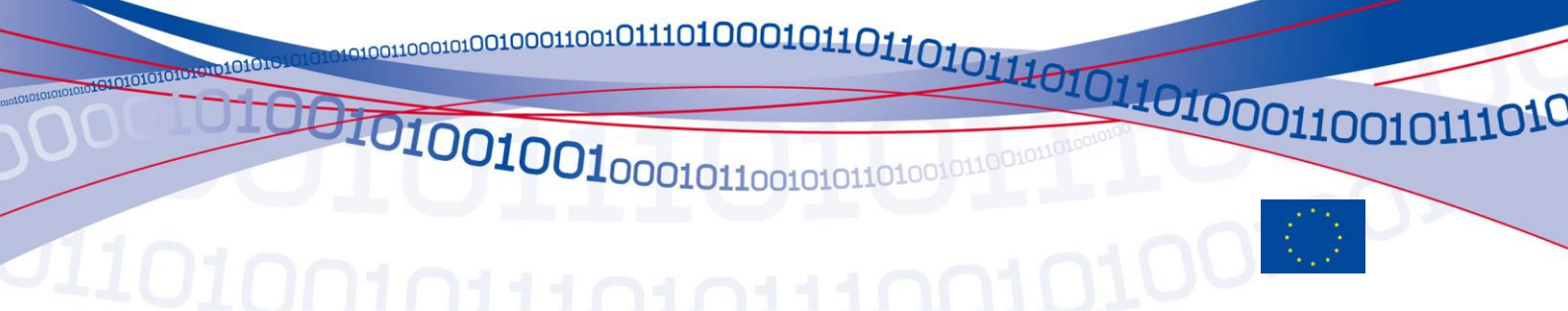
About ENISA

The European Network and Information Security Agency (ENISA) is an EU agency created to advance the functioning of the internal market. ENISA is a centre of excellence for the European Member States and European institutions in network and information security, giving advice and recommendations and acting as a switchboard for information on good practices. Moreover, the agency facilitates contacts between European institutions, the Member States, and private business and industry actors.

This work described in this document takes place in the context of ENISA's Emerging and Future Risk programme.

CONTACT DETAILS

For more information, please contact:

e-mail: RiskManagement@enisa.europa.eu

Internet: http://www.enisa.europa.eu/

CONTENTS

INDEX OF FIGURES

INDEX OF TABLES

1 INTRODUCTION AND FUNCTION OF THIS MANUAL

The European Network Information Security Agency (ENISA), among its other duties, is tasked with collecting information in order to analyse current and emerging risks which could impact on the availability of electronic systems and networks; or on the confidentiality and integrity of the information which they transmit, store and process. ENISA has therefore undertaken the development of a Framework for the analysis and reporting of emerging and future risks in the area of network information security. ENISA defines emerging risks as those that may have an impact between one and five years in the future; and future risks as those that may have an impact more than five years in the future.

This Manual provides an overview of the processes involved in the Emerging and Future Risks (EFR) Framework. It is intended as an introduction to the EFR Framework and as a guide to how it is used in practice. This Manual has been produced in response to a review of the EFR Framework following its use for the production of a number of reports. It contains modifications and additions to the Framework that have been suggested by its users, as a result of their experience.

The Manual should be read by all those who take part in the EFR Framework process, as a contributor, expert or other stakeholder. Those who read the assessment reports produced by the EFR Framework may also wish to read this Manual in order to understand how EFR assessments are produced. Finally, other groups may wish to use this Manual as an introductory guide to developing their own processes for assessing emerging and future risks.

Note: for detailed and in-depth explanations of the EFR Framework processes; readers are referred to the supporting documentation referenced at annex A.

2 THE EFR FRAMEWORK: CONCEPT AND PURPOSE

The EFR Framework is based around the use of predictive, narrative "scenarios". The idea of using scenarios in this way was developed in the 1950s and 1960s both in the USA and Europe. Initially "scenario planning", as it is called, was used by governments for predicting the outcome of social changes; and later by large corporations for commercial planning in the face of market developments. The concept behind scenario planning is essentially simple: it facilitates the telling of realistic stories about possible (or probable) future events, based on extrapolation from present trends.

In scenario planning the effect of (usually two) driving forces on current trends is examined. The extreme (but probable) outcomes of the driving forces are deduced; and "scenarios" are written describing these outcomes. Usually between two and four scenarios are produced and plotted on a two by two matrix that has, as its axes, the selected driving forces. The purpose of scenario planning is to alert decision makers to possible outcomes of current trends and thereby to influence the decisions they make. The use of scenarios, rather than any other form of analysis, is intended to ensure that the extrapolations are both realistic and can be understood and appreciated by the decision makers.

ENISA's use of scenarios in the EFR Framework is somewhat different in function and purpose from that described above. The concept of developing a narrative scenario, embodying a plausible extrapolation from current trends, has been retained. However, in the EFR Framework, a single technology, or prospective use of that technology, is selected for consideration. This is then built into a unique scenario that describes a situation in the future; in which that technology, or its functionality, has been deployed. For example: previous scenarios developed by ENISA have described the results of being able to gain ubiquitous access to electronic health care information; and the development of technologies that enable all programs and operating systems to be held "in the cloud", rather than on individual systems.

Once an area of EFR interest has been selected; a narrative story or "scenario" is written. The concepts underlying the story are then subjected to a risk assessment process. This looks at the technology and its use, as described in the narrative, in order to identify possible threats and vulnerabilities. From these, the assessment deduces the potential risk to the assets mentioned by the narrative. The assessment may also describe the management and mitigation of those risks through the deployment of controls. The scenario and its assessment are then written as an ENISA report, and published on the ENISA website.

The purpose of the ENISA EFR Framework is similar to that of classical scenario planning; in that it alerts those reading the report to possible future outcomes of current trends. However, the EFR Framework is both more narrowly targeted and more structured; in that it delivers a reasoned assessment of the risks inherent in the technology and its use.

EFR assessment reports should be read by appropriate target audiences in order to ensure that the risks (both positive and negative) inherent in a technology and its use are recognised and understood. If considered necessary and appropriate, comprehension of the risks will enable decision makers to take appropriate steps to manage and mitigate them, where possible.

3   THE EFR FRAMEWORK PROCESSES

At figure 1, below, is a simplified, outline flow diagram showing the processes of the EFR Framework. These are as follows:

A. Information Management
B. Topic Selection
C. Scenario Building and Analysis
D. Risk Assessment
E. Assessment Reporting
F. Promotion, Dissemination and Feed-back
G. Continuous Improvement.

In the sections below, each of the seven processes is described in more detail. Each section consists of the following elements:

- An overall description of the process.
- The objectives of the process.
- A flow diagram, showing the steps in the process.
- A process description table, showing:
  - Inputs to each step of the process
  - A brief description of each step
  - Outputs from each step
  - A list of the main contributors to the step. The main contributors being either ENISA staff, ENISA management, members of the EFR Stakeholder Forum, subject matter experts or external contractors, the ENISA Permanent Stakeholders Group (PSG) and the ENISA Management Board.
- A list of the technology and tools (such as templates) used in the process.

This introductory manual does not attempt to describe in detail the technology used to support processes, or how the process steps are carried out. Nor does it attempt to define roles and responsibilities in relation to the processes. Detailed descriptions of these can be found in the supporting documentation referenced at annex A.
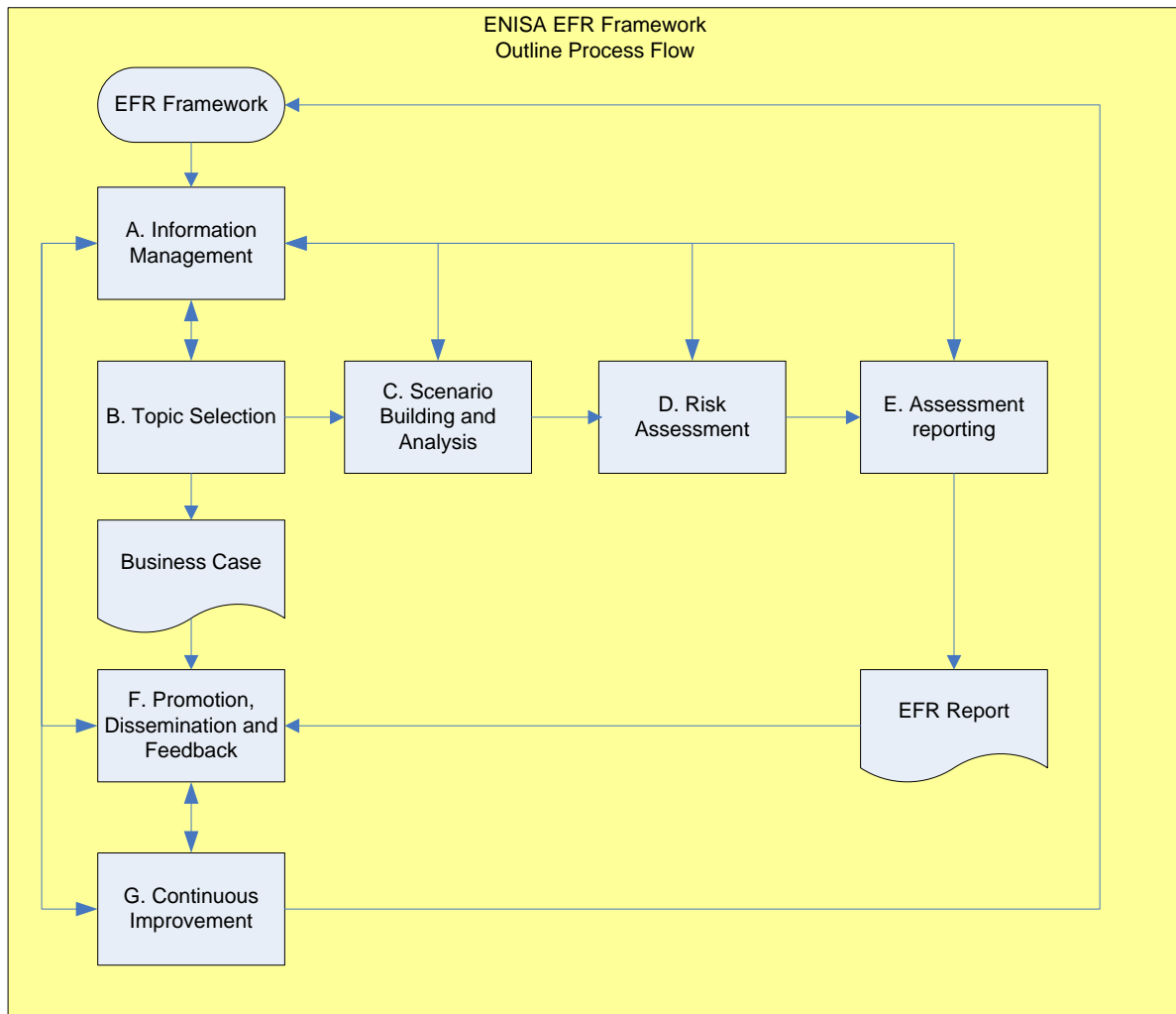
FIGURE 1: EFR FRAMEWORK: OUTLINE PROCESSES

3.1 A. INFORMATION MANAGEMENT

Information management is central to the operation of the EFR Framework, as can be seen from figure 1. Information management requires the establishment of an efficient knowledge database for the storage of information about technology trends and concerning the operation of the Framework itself. It also requires the implementation and maintenance of an effective collaboration platform, or "portal" to ensure efficient transfer of information between those involved in the process and to ensure quality control. These elements can be seen in figure 2, below.

3.1.1 OBJECTIVES

The objectives of the information management process are as follows:

- To gather information about technology and process trends of relevance to the EFR Framework.
- To analyse that information and store it in an information management system.
- To disseminate that information, as required, to those involved in the production of EFR assessments.
- To manage information flow between those involved in the production of EFR assessments, using appropriate collaboration tools, such as a web-based portal.
- To manage information flow between Framework processes; providing quality assurance at each stage during the production of an EFR assessment.
- To ensure that information concerning the operation of the EFR Framework processes is gathered and stored appropriately.

3.1.2 PROCESS STEPS

Figure 2, below shows the steps in the information management process.

EFR Framework: Information Management
Process Flow

New Technology and Process Data

Start EFR Framework → A1. Information collection → EFR Knowledge database

A3. Establish and maintain the portal

A2. Trend analysis

A4. Use portal ↔ B. Topic Selection

Topic OK? — No

Yes

A4. Use portal ↔ C. Scenario Building and Analysis

Scenario/ Analysis OK? — No

Yes

G. Continuous Improvement ← EFR Knowledge database [OA1.4] ← A4. Use portal ↔ D. Risk Assessment

A4. Use portal

Assessment OK? — No

Yes

F. Marketing, Dissemination and Feedback ← E. Assessment Reporting

FIGURE 2: INFORMATION MANAGEMENT PROCESS FLOW DIAGRAM

3.1.3 PROCESS DESCRIPTION TABLE

In the table below, the first column shows the steps of the process, as outlined in the process flow diagram above. The second column shows the essential inputs required by the steps. The third column is an outline description of the procedures that take place in the steps; each procedure is numbered. The fourth column indicates the most important outputs from the steps; each output is given a unique reference number (e.g. OA1.1), as these outputs will form inputs into other steps in this process, or other processes. The final column suggests those who will contribute to the steps.

Step	Input	Description	Output	Contributors
A1. Information Collection	Information from external sources about new technologies and processes. Commentary from subject matter experts.	1. List of relevant information sources (Websites; publications; journals etc.) compiled. 2.List of appropriate subject matter experts (with contact details) compiled. 2. Sources regularly examined for information of relevance to EFR Framework. 3. Information collected and comment received from subject matter experts. 4. Compiled and commented information passed to EFR knowledge database.	List of information sources [OA1.1]. List of subject matter experts [OA1.2]. Compiled information on new technology and processes, with expert commentary where appropriate [OA1.3] passed to step A2 and stored in EFR knowledge database [OA1.4].	ENISA staff. Subject matter experts.

Step	Input	Description	Output	Contributors
A2. Trend Analysis	Information on selected scenario topic [OB1.1]. OA1.3. from step A1	1. Information about the selection of a topic for an assessment report is gathered. 2. Relevant information (with commentary) retrieved from the EFR knowledge database. 3. Technology and process trends related to the topic analysed, with assistance from appropriate subject matter experts. 4. Analysed trend information passed to scenario building process (C) and scenario analysis process (D)	Analysed technology trend information [OA2.1] passed to processes B, C and D.	ENISA staff. Subject matter experts.
A3. Establish and maintain the portal	Appropriate technology and processes	1. ENISA selects appropriate technology and processes to develop a portal to facilitate collaborative working between ENISA staff and other contributors to the EFR Framework. Note: this is a one-off process. 2. The technology is implemented, processes are devised and a handbook is produced. 3. Access to the portal, the handbook and suitable instruction is given to all contributors to the EFR Framework. 4. The portal is maintained and developed to ensure efficient and effective collaboration in the production of EFR assessment reports.	A maintained portal with instructions for use [OA3.1]	ENISA staff. External contractors where necessary and appropriate

Step	Input	Description	Output	Contributors
A4. Use the portal	OA3.1. Output from processes B, C, D, E, F and G.	1. For each process in the EFR Framework, the portal is used to coordinate action and to communicate information and working documents. 2. For each process the portal is used to perform quality assurance of the process outputs. Quality assurance is provided by either the EFR Stakeholder Forum or ENISA staff, as appropriate. 3. If the process output is of appropriate quality, the output is passed to the next process. 4. If the process output is not of appropriate quality, recommendations for quality improvement are made and appropriate contributors re-visit the output. 5. All relevant information about the operation of the processes is stored on the EFR knowledge database.	Process output checked for quality [OA4.1]. Information about process operation stored in EFR knowledge database [OA4.2].	ENISA staff. Subject matter experts. EFR Stakeholder Forum.

TABLE 1: INFORMATION MANAGEMENT PROCESS DESCRIPTION

3.1.4 TECHNOLOGY AND TOOLS

The following technology and tools are used in this process:

- A knowledge database, allowing structured storage of EFR information, technology and process trend data etc.
- A web-based portal, hosted on the ENISA website, including:
  - A full description of the portal (termed a "collaboration platform").
  - Instructions for use of the portal (including roles and responsibilities).

3.2 B. TOPIC SELECTION

The process of topic selection for an EFR assessment report follows an annual cycle. The first phase of this is to identify broad areas of concern in relation to emerging and future risks as identified by the

previous year's trend analysis, with input from ENISA's work programme, the EFR Stakeholder Forum and ENISA's Permanent Stakeholder Group (PSG).This is then subject to a call for scenario proposals, published on the ENISA website in December. Eligible scenarios are submitted to the PSG for consideration and ranking. The top-ranked proposals will be chosen for EFR Framework assessment. A business case will be produced for each chosen scenario. This will identify the scope, target audience and objectives for the assessment report, including the need to identify risk treatments, where appropriate.

3.2.1 OBJECTIVES

The objectives of topic selection are as follows:

- To identify and select annually appropriate topic areas for EFR assessment reports.
- To ensure that an appropriate target audience is identified for the topics selected.
- To ensure that the scope of each assessment report has been correctly identified and fully defined.
- To ensure that the objectives for the assessment reports have been defined; in terms of likely outcomes and potential actions consequent on publication of the reports.

3.2.2 PROCESS STEPS

Figure 3, below, shows the steps in the topic selection process.
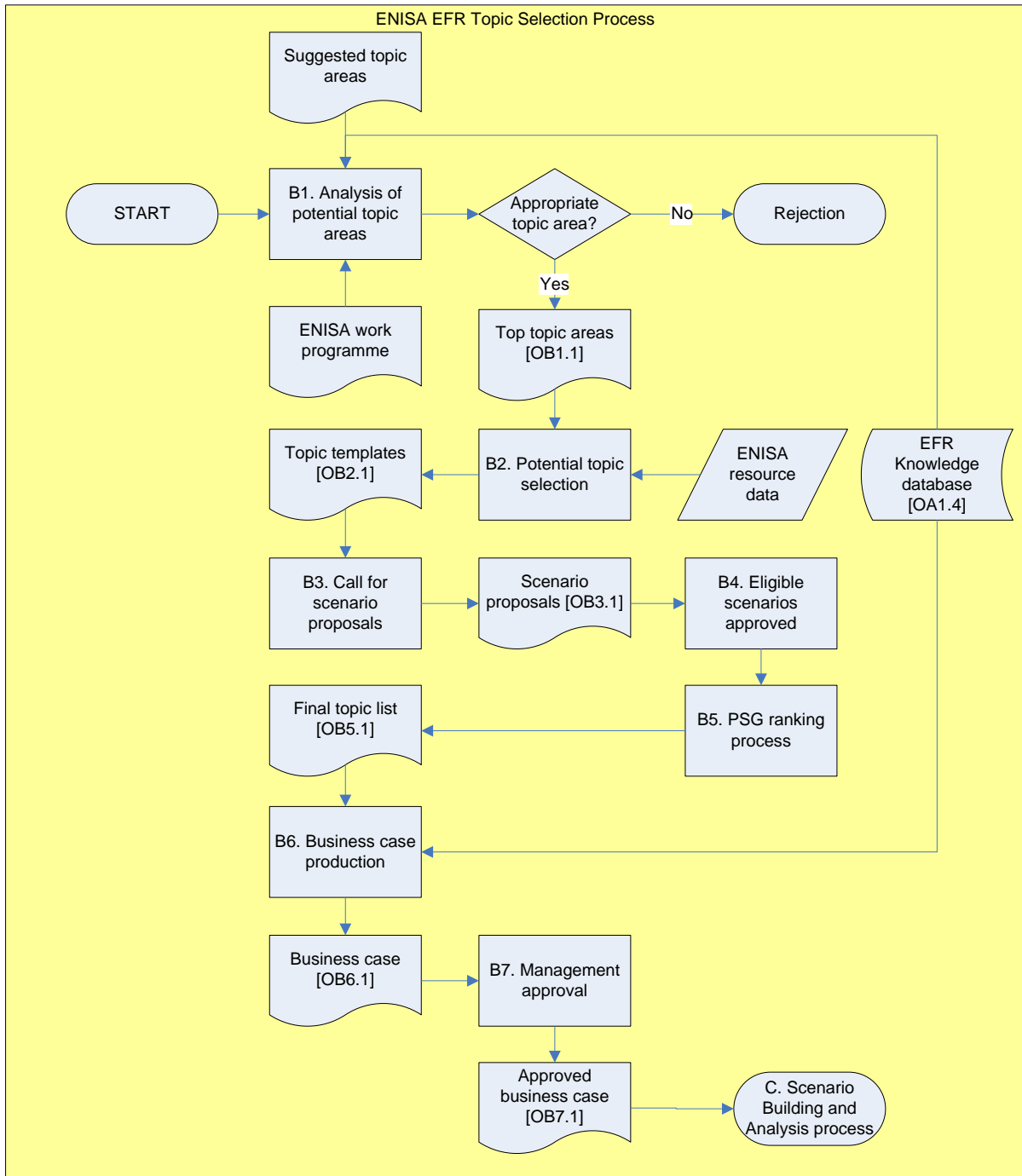
FIGURE 3: TOPIC SELECTION PROCESS FLOW DIAGRAM

3.2.3 PROCESS DESCRIPTION TABLE

In the table below, the first column shows the steps of the process, as outlined in the process flow diagram above. The second column shows the essential inputs required by the steps. The third column is an outline description of the procedures that take place in the steps; each procedure is numbered.

The fourth column indicates the most important outputs from the steps; each output is given a unique reference number (e.g. OA1.1), as these outputs will form inputs into other steps in this process, or other processes. The final column suggests those who will contribute to the steps.

Step	Input	Description	Output	Contributors
B1. Analysis of potential topic areas	Suggestions for topic areas from ENISA stakeholders and contributors. Trend analysis data from EFR knowledge database [OA1.4]. ENISA work programme.	1. All ENISA contributors and stakeholders are encouraged to suggest topics for EFR assessments. 2. Topic suggestions are analysed in relation to trend data from the EFR knowledge database. 3. Potential topic areas are analysed in relation to work areas planned for the coming year under the ENISA work programme. 4. Suggestions which are not in tune with trend analysis and/or the ENISA work programme are rejected. 5. A list of top topic areas for potential EFR assessment is compiled and passed to step B2.	List of top topic areas for EFR assessment [OB1.1] passed to step B2.	All ENISA contributors and stakeholders. ENISA staff.
B2. Potential topic selection	List of top topic areas [OB1.1] from step B1. ENISA resource data.	1. Generic template call for potential scenarios to be suggested by ENISA contributors and stakeholders compiled. 2. Number of EFR assessments possible during the year determined in light of available ENISA resources. 3. Top topic areas examined and prioritised in light of available ENISA resources. 4. Calling template populated with selected priority topic areas and passed to step B3.	Scenario call template populated with top topic areas [OB2.1] and passed to step B3.	ENISA staff

Step	Input	Description	Output	Contributors
B3. Call for scenario proposals	Scenario call template [OB2.1] from step B2.	1. Instructions for completing proposal template, including list of those eligible to make proposals, drawn up and proposal deadline decided. 2. In December, template published as a web-enabled form on ENISA website. 3. ENISA stakeholders and eligible contributors encouraged to make scenario proposals. 4. Proposals received by the selected deadline (end of January in the following year).	Web-enabled submission forms for scenario proposals [OB3.1} completed by contributors.	ENISA staff. Invited, eligible, contributors
B4. Eligible scenarios approved	Submission forms [OB3.1] from step B3.	1. Submitted proposal forms examined to check for eligibility, appropriateness and completeness. 2. Eligible, complete and appropriate proposals examined for suitability of proposed scenarios to be used as the basis for an EFR assessment report. 3. List of eligible, appropriate and suitable scenario proposals complied and sent to step B5.	List of suitable scenario proposals [OB4.1] to step B5.	ENISA staff.
B5. PSG ranking process	List of suitable scenario proposals [OB4.1].	1. ENISA agrees rating process for proposals. Potential parameters include: relevance to potential target audience; contribution to ENISA's aims; and potential positive outcome from assessment. 2. List of suitable scenario proposals submitted to ENISA Permanent Stakeholders Group (PSG). 2. PSG asked to rate listed proposals using agreed parameters. 3. Proposals ranked according to	List of proposals with scores from PSG and ranking [OB5.1], passed to step B6.	ENISA staff. PSG.

Step	Input	Description	Output	Contributors
		scores determined following outcome of PSG rating. 4. Ranked list of proposals passed to step B6.		
B6. Business case production	Ranked proposals [OB5.1] from step B5. EFR Knowledge database.	1. ENISA staff prepare a business case for the top-ranked proposals, using a business case template and information from EFR Knowledge database. 2. Business case includes: consideration of scope of assessment to be performed; potential target audience for assessment; objectives and outcomes (including benefit) of publication of report; relevant associated work and initiatives; indication of resources required. 3. Completed business case passed to step B7.	Completed business case [OB6.1] passed to step B7.	ENISA staff.
B7. Management approval	Business case [OB6.1] from step B6.	1. Business cases for EFR assessment report proposals agreed by ENISA senior management. 2. Appropriate resource allocation agreed by senior management. 3. Business cases, with note of resources allocated, may be passed to ENISA Management Board for approval if necessary. 4. Approved business cases passed to process C. (Scenario Building and Analysis).	Business cases with ENISA management approval [OB7.1] passed to process C (Scenario Building and Analysis).	ENISA senior management. ENISA Management Board (if necessary).

TABLE 2: TOPIC SELECTION PROCESS DESCRIPTION

3.2.4 TECHNOLOGY AND TOOLS

The following technology and tools are used in this process:

- A knowledge database, allowing structured storage of EFR information, technology and process trend data etc.

- A web-based portal, hosted on the ENISA website.
- "Call for scenario proposals" template (see annex B).
- An EFR assessment business case template. (see annex C).

3.3 C. Scenario Building and Analysis

Building and analysing the scenario involves taking the proposed scenario from the topic selection process and, through the use of subject matter experts, turning it into an agreed narrative form and identifying the critical components of the narrative. These components will be realistic and will include a timeframe over which it happens, and an agreed set of actors, technologies applications and processes. The data at potential risk will be defined and agreed, as will the social, political and technical drivers that have led to the scenario. Once the narrative structure and its content have been defined, analysed and agreed, these will be quality assured and passed to the risk assessment process.

3.3.1 Objectives

The objectives of scenario building and analysis are as follows:

- To select appropriate subject matter experts to collaborate on the building, analysis and assessment processes.
- To determine the nature of the scenario.
- To agree the scenario narrative.
- To agree the timeframe, location, actors, technology and applications, data and drivers in the scenario narrative.
- To document the agreed scenario build and analysis and obtain sign-off.

3.3.2 Process Steps

Figure 4, below, shows the steps in the scenario building and analysis process.

ENISA EFR Framework: Scenario Building and Analysis Process

B. Topic Selection process

Selected topic [OB7.1]

C1. Subject matter expert selection

List of subject matter experts

EFR Knowledge database [OA1.4]

C2. Determine nature of scenario and agree narrative

Scenario template

C3. Agree timeframe, location, actors, technology etc.

C4. Document scenario and QA

Document OK?

No

C4. Make necessary changes

Documented Scenario [OC4.1]

Yes

D. Risk Assessment process

FIGURE 4: SCENARIO BUILDING AND ANALYSIS PROCESS FLOW DIAGRAM

3.3.3 PROCESS DESCRIPTION TABLE

In the table below, the first column shows the steps of the process, as outlined in the process flow diagram above. The second column shows the essential inputs required by the steps. The third column is an outline description of the procedures that take place in the steps; each procedure is numbered. The fourth column indicates the most important outputs from the steps; each output is given a unique reference number (e.g. OA1.1), as these outputs will form inputs into other steps in this process, or other processes. The final column suggests those who will contribute to the steps.

Step	Input	Description	Output	Contributors
C1. Subject matter expert selection	Selected scenario topic [OB7.1] from Topic Selection (process B). List of subject matter experts.	1. Selected topics examined in the light of information about technology trends from the EFR knowledge database. 2. List of ENISA subject matter experts examined to determine appropriate involvement in suggested scenario topic. 3. Subject matter experts approached and timetable for scenario building meeting(s) agreed. 4. Contact details of chosen experts and meeting arrangements documented and passed to step C2.	Contact details and meeting arrangements for experts [OC1.1] passed to next step.	ENISA staff. Subject matter experts.
C2. Determine nature of scenario and agree narrative	Contact details and meeting arrangements for experts [OC1.1]. Selected scenario topic [OB7.1]. EFR Knowledge database [OA1.4].	1. Selected scenario topic discussed at meeting of experts (note: meetings can be real or virtual, although real meetings are recommended). 2. Experts are fully briefed by ENISA staff on the EFR Framework processes, including risk assessment methods. 3. Technology trends relevant to the scenario (from EFR Knowledge database) examined. 4. Nature of scenario (predictive or explorative) and assumptions underlying the scenario agreed. 5. Narrative flow of the scenario, discussed and agreed. 6. Scenario template built with agreed nature, assumptions and narrative. 7. Agreement of timing and nature of next meeting to complete build of scenario	Scenario template with nature, assumptions and narrative [OC2.1] to next step. Agreed timing and nature of next scenario build meeting [OC2.2].	ENISA staff. Subject matter experts.

Step	Input	Description	Output	Contributors
		template.		
C3. Agree timeframe, location, actors, technology etc.	Scenario template [OC2.1} and agreed meeting [OC2.2]. EFR Knowledge database [OA1.4].	1. Scenario narrative etc. discussed at meeting of experts (note: meetings can be real or virtual, although real meetings are recommended). 2. Technology trends relevant to the scenario (from EFR Knowledge database) examined. 3. Location, timeframe, actors, technologies and systems, data at potential risk and socio-economic, political etc. drivers for the scenario agreed. 4. All elements documented in the scenario template and passed to the next step.	Scenario template with completed build details [OC3.1] passed to next step.	ENISA staff. Subject matter experts.

Step	Input	Description	Output	Contributors
C4. Document scenario and QA	Scenario template [OC3.1]	1. ENISA staff ensure that scenario template has been completed with build and analysis details and has captured all scenario requirements. 2. ENISA staff pass checked template to EFR Stakeholder Forum for quality assurance. 3. EFR Stakeholder Forum examine scenario template and agree changes (if required). 4. Quality assured scenario build template passed to Scenario Analysis (process D).	Scenario template, quality assured, [OC4.1] to process D.	ENISA staff. EFR Stakeholder Forum.

TABLE 3: SCENARIO BUILDING AND ANALYSIS PROCESS DESCRIPTION

3.3.4 TECHNOLOGY AND TOOLS

The following technology and tools are used in this process:

- A knowledge database, allowing structured storage of EFR information, technology and process trend data etc.
- A web-based portal, hosted on the ENISA website.
- A scenario building and analysis template (see annex D).

3.4 D. RISK ASSESSMENT

This process identifies the assets (both tangible and intangible) described in the scenario that are at potential risk, threats to those assets implied by the scenario and the vulnerabilities that are inherent both in the technology used in the scenario and in the way that it is deployed by the identified actors in the scenario. The potential impact that threats could have on the assets (financial, political, physical and human), are agreed. The risks associated with the scenario are subject to an assessment using a chosen methodology. The analysis is conducted by a risk assessment expert and the results are fully documented; indicating the details of the risk identification, analysis and evaluation. If the scenario business case calls for it (depending on its nature) an evaluation of risk treatment is also carried out, looking at potential options for actions to be taken to manage or mitigate the identified risks.

3.4.1 OBJECTIVES

The objectives of risk assessment are as follows:

- To identify the elements inherent in the scenario that are required to perform a risk assessment on that scenario. These include:
  - Threats;
  - Vulnerabilities;
  - Assets at risk;
  - Potential impact on those assets.
- To select an appropriate risk assessment methodology.
- To analyse the risks and evaluate them.
- To identify a risk treatment plan, if called for by the business case.

3.4.2 PROCESS STEPS

Figure 5, below, shows the steps in the risk assessment process.
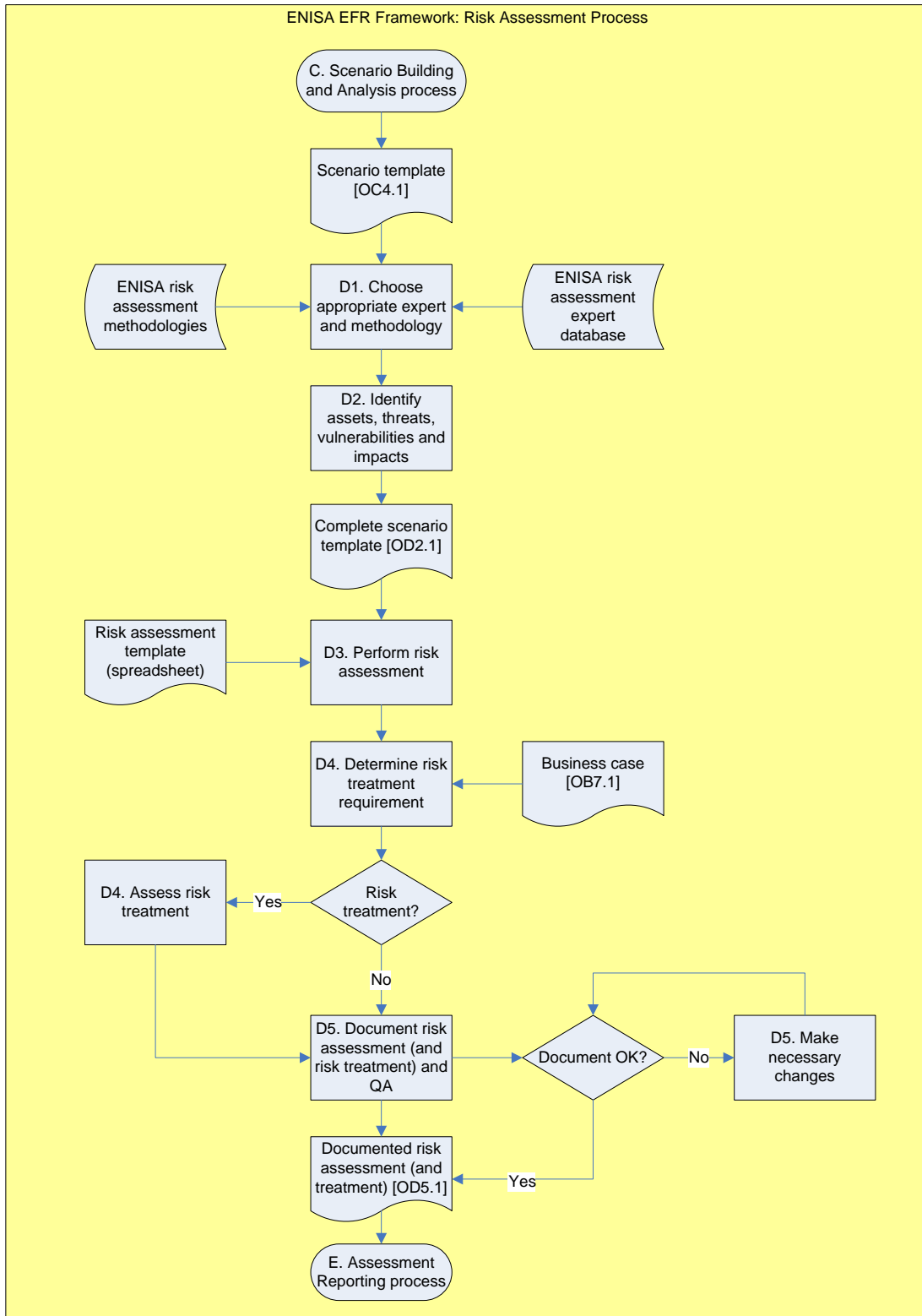
FIGURE 5: RISK ASSESSMENT PROCESS FLOW DIAGRAM

3.4.3 PROCESS DESCRIPTION TABLE

In the table below, the first column shows the steps of the process, as outlined in the process flow diagram above. The second column shows the essential inputs required by the steps. The third column is an outline description of the procedures that take place in the steps; each procedure is numbered. The fourth column indicates the most important outputs from the steps; each output is given a unique reference number (e.g. OA1.1), as these outputs will form inputs into other steps in this process, or other processes. The final column suggests those who will contribute to the steps.

Step	Input	Description	Output	Contributors
D1. Choose appropriate expert and methodology	ENISA list of risk assessment experts. Scenario template [OC4.1]. ENISA risk assessment methodologies database.	1. ENISA selects an appropriate expert to lead the risk assessment process. 2. The scenario build and analysis template is examined by the chosen risk assessment expert, in order to identify an appropriate risk assessment methodology. 2. The appropriate methodology is selected. Either from the ENISA risk assessment methodologies database or from any other source. 3. Reasons for the selection of the methodology are documented and a brief introduction to the methodology for non-experts is produced. 4. Introduction to chosen methodology and completed scenario template passed to step E2.	Brief introduction to chosen methodology [OD1.1] passed to step D2.	ENISA staff. Risk assessment expert

Step	Input	Description	Output	Contributors
D2. Identify assets, threats, vulnerabilities and impacts	Scenario template from previous process [OC4.1].	1. A meeting of subject matter experts (note: meetings can be real or virtual, although real meetings are recommended),.is led by the risk assessment expert and determines the significant assets that are at risk in the described scenario. Both tangible and intangible assets are identified and their role in the scenario is clarified. Asset ownership and value (on a scale of 1 to 10) is identified. 2. Vulnerabilities related to identified assets are agreed and their significance assessed (high, medium or low). 3. Potential threats are identified. The vulnerabilities that they can exploit are recorded, as is the nature of the threat and an assessment (high, medium or low). 4. Controls for the threats and vulnerabilities are identified. The controls are described, as is their mitigating or management action. The effectiveness of the controls is assessed (high, medium or low). 5. The potential impact on the scenario's assets is determined. Socio-political, legal and ethical, financial and economic, organisational and technical and human impacts are considered. 6. Acceptable risk levels are identified, as are any assumptions made and the rationale behind the choices. 7. All information is documented in the scenario template and passed to next step.	Completed scenario template [OD2.1] passed to next step	Risk assessment expert. Subject matter experts

Step	Input	Description	Output	Contributors
D3. Perform risk assessment	Introduction to chosen methodology [OE1.1]. Completed scenario template [OD2.1]. Risk assessment spreadsheet.	1. Subject matter expert group given introduction to chosen methodology. and methodology explained. Note: this can also be done in the scenario build and analysis process (step C2). 3. Expert group, led by risk assessment expert, conduct risk assessment, based on scenario analysis, using chosen methodology. 4. Risks identified, analysed and evaluated using risk assessment spreadsheet. 5. Spreadsheet passed to step D4.	Spreadsheet with risk identification, analysis and evaluation [OD3.1]	Risk assessment expert. Subject matter experts.
D4. Determine requirement and assess risk treatment	Risk assessment spreadsheet [OD3.1]. Business case [OB7.1]	1. Subject matter expert group determine if risk treatment policy is in line with requirements of business case. 2. If the decision is to assess a risk treatment, risk assessment expert should lead the subject matter expert group to determine potential actions to manage and mitigate the identified, evaluated risks. 3. The risk assessment spreadsheet should be completed and passed to step D5.	Risk assessment spreadsheet with risk treatment assessment where appropriate [OD4.1]	Risk assessment expert. Subject matter experts.

Step	Input	Description	Output	Contributors
D5. Document risk assessment (and risk treatment) and QA	Risk assessment template [OD4.1]	1. ENISA staff should check the risk assessment spreadsheet to ensure that all necessary steps in the methodology have been carried out correctly. 2. ENISA staff should ensure that all relevant issues have been documented (including decision on risk treatment). 3. If any issues are unclear or incomplete, the subject matter experts should be asked to re-visit the issue(s). The completed risk assessment (and risk treatment where appropriate) should be fully documented and passed to F Assessment Reporting process.	Documented risk assessment (and treatment) [OE4.1] to process E.	ENISA staff.

TABLE 4: RISK ASSESSMENT PROCESS DESCRIPTION

3.4.4 TECHNOLOGY AND TOOLS

The following technology and tools are used in this process:

- A web-based portal, hosted on the ENISA website.
- A scenario buiding and analysis template (see annex D).
- A database of risk assessment experts.
- A database of risk assessment methodologies.
- An EFR assessment business case template (see annex C).
- A risk assessment template (see annex E).

3.5 E. ASSESSMENT REPORTING

This process provides the interface between the EFR assessment Framework and the target audience for assessment reports. The target audience(s) will have been identified as part of the business case, as will the objectives for the report. The Assessment Reporting process should decide the format for the report (based on a standard template). The process ensures that the report is written in such a way as to address the target audience and to meet its objectives. The process also ensures that the report is produced to a consistently high quality and standard. Finally, the process ensures that the report is published, usually on the ENISA website, within an agreed timeframe.

3.5.1 OBJECTIVES

The objectives of assessment reporting are as follows:

- To ensure that assessment reports are written in a standard EFR format, clearly identifying them as EFR assessment reports.
- To ensure that reports are written in such a way as to clearly address their target audience and to meet the objectives stated in their business cases.
- To ensure that the assessment reports are written to a consistently high standard of clarity, readability and accuracy.
- To ensure that assessment reports are published (on the ENISA website) in a timely fashion.

3.5.2 PROCESS STEPS

Figure 6, below, shows the steps in the assessment reporting process.

ENISA EFR Framework: Assessment Reporting Process

D. Risk Assessment process

Documented risk assessment (and treatment) [OD5.1]

Complete scenario template [OD2.1] → E1. Create assessment report template → EFR assessment report template

Business case [OB7.1] → E2. Write report for target audience and objectives ← E1. Document report template with scenario and assessment

Draft EFR assessment report

E3. QA report for clarity, accuracy etc. → Report OK? → No → E3. Make necessary changes

Yes

E4. Obtain management agreement

EFR Assessment Report [OE4.1]

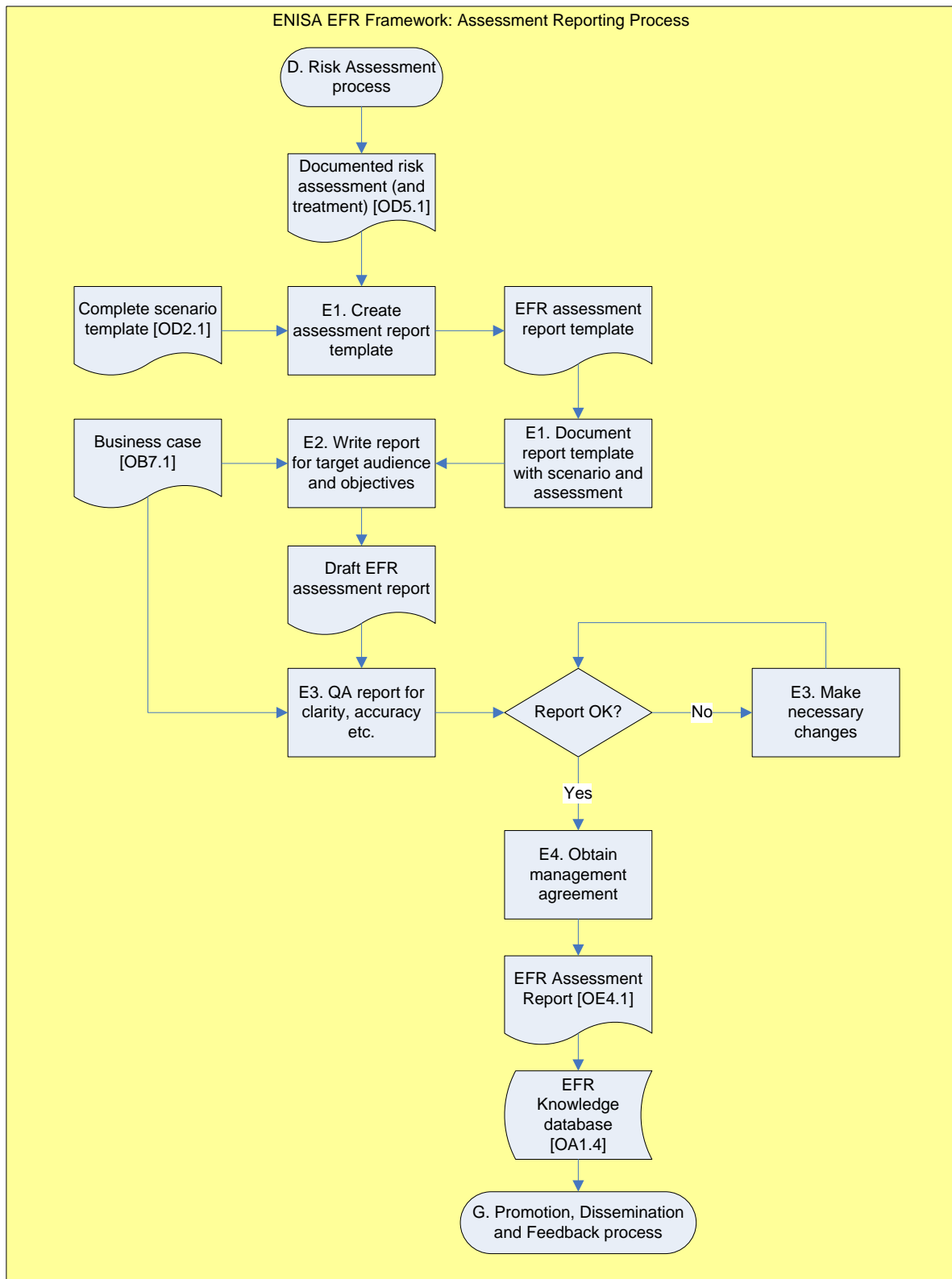EFR Knowledge database [OA1.4]

G. Promotion, Dissemination and Feedback process

FIGURE 6: ASSESSMENT REPORTING PROCESS FLOW DIAGRAM

3.5.3 PROCESS DESCRIPTION TABLE

In the table below, the first column shows the steps of the process, as outlined in the process flow diagram above. The second column shows the essential inputs required by the steps. The third column is an outline description of the procedures that take place in the steps; each procedure is numbered. The fourth column indicates the most important outputs from the steps; each output is given a unique reference number (e.g. OA1.1), as these outputs will form inputs into other steps in this process, or other processes. The final column suggests those who will contribute to the steps.

Step	Input	Description	Output	Contributors
E1. Document report template	Documented risk assessment [OD5.1]. Scenario template [OD2.1]..	1. An individual should be given overall responsibility for production of the assessment report, as designated report owner (or project manager). 2. An assessment report template should be created, based on the common features of previous EFR assessment reports. 3. The report template should be populated with the built scenario and analysis (data from the scenario template) and with the risk evaluation (data from the documented risk assessment). 4. The report template should be checked to ensure that it contains all relevant data and passed to step F2	Populated EFR assessment report template [OE1.1] to step E2.	ENISA staff. Designated report owner (project manager).
E2. Write report for target audience	Report template [OE1.1]. Business case [OB7.1]	1. The designated report owner (project manager) should appoint an appropriate report author (this could be a professional writer, if resources permit, or a member of ENISA staff). 2. The appointed report author should draft the EFR assessment report, based on the populated assessment report template 3. The report owner (project	Draft EFR assessment report [OE2.1] to next step.	Report owner (project manager). Report author.

Step	Input	Description	Output	Contributors
		manager) should ensure that the draft EFR assessment report is written in such a way as to address the target audience, as agreed in the business case. 4. The report owner (project manager) should ensure that the draft EFR assessment report is written in such a way as to meet the objectives set out in the business case. 5. The draft EFR assessment report should be checked to ensure that all data from the template has been included and passed to step E3.		
E3. QA report	Draft EFR assessment report [EF2.1]. Business case [OB7.1].	1.The report owner (project manager) should designate appropriate individuals to provide quality assurance for the draft report. These could be members of ENISA staff or the EFR Stakeholder Forum, or subject matter experts. Preferably they would include a representative of the target audience 2. The designated quality assurors should read the draft report to ensure clarity, accuracy and appropriateness to the target audience. 3. Quality assurors should determine if the stated objectives for the report have been achieved. 4. If there are issues with the report, these should be brought to the attention of the report owner (project manager) and corrections made where	Final version of EFR assessment report {OE3.1} to next step.	Report owner (project manager). Designated quality assurors.

Step	Input	Description	Output	Contributors
		necessary. 5. The final version of the EFR assessment report should be passed to step E4.		
E4. Obtain management agreement .	Final report version [OE3.1]	1. The final version of the EFR assessment report should be passed to ENISA management for approval. 2. ENISA management should determine if the report requires to be seen by the PSG, the Management Board or other stakeholders before publication. Also if any changes need to be made for legal or other reasons. 3. The final, approved report should be passed to Promotion, Dissemination and Feedback process, and stored in the EFR knowledge database [OA1.4].	Published report [OE4.1] to the EFR knowledge database [OA1.4] and process F.	ENISA management. ENISA staff. PSG or Management Board if appropriate.

TABLE 5: ASSESSMENT REPORTING PROCESS DESCRIPTION

3.5.4 TECHNOLOGY AND TOOLS

The following technology and tools are used in this process:

- A web-based portal, hosted on the ENISA website.
- A scenario building and analysis template (annex D).
- An EFR assessment business case template (annex C).
- A risk assessment spreadsheet (annex E).
- An EFR assessment report template (annex F).
- EFR Knowledge database.

3.6 F. PROMOTION, DISSEMINATION AND FEEDBACK

The purpose of this process is to ensure that assessment reports reach the designated target audience and meet the objectives identified in the business case. This is achieved by defining key elements of the promotion programme; including the launch method, news releases surrounding publication, distribution and feedback. The process also identifies and maintains data on key communication channels for the report. All these issues are documented in a dissemination, promotion and feedback plan, and approval obtained for it. The process ensures that the ENSIA website will meet report

download requirements and identifies any modifications that may be required. If necessary, external promotion resources are identified and costed. Clear feedback requirements, following publication of reports, are identified and developed where necessary; as are methods to capture feedback and measure effectiveness of report (e.g. number of downloads and citations etc).

Note: promotion activities will be carried out by the appropriate department within ENISA, in cooperation with the risk assessment and management group.

3.6.1 OBJECTIVES

The objectives of the promotion, dissemination and feedback process are as follows:

- To ensure that the EFR assessment reports are read by the target audience agreed in the business case.
- To enable a wider range of audience to be identified and reached.
- To identify the most appropriate methods for distribution of the EFR assessment reports.
- To capture feedback and measure effectiveness in a structured manner.

3.6.2 PROCESS STEPS

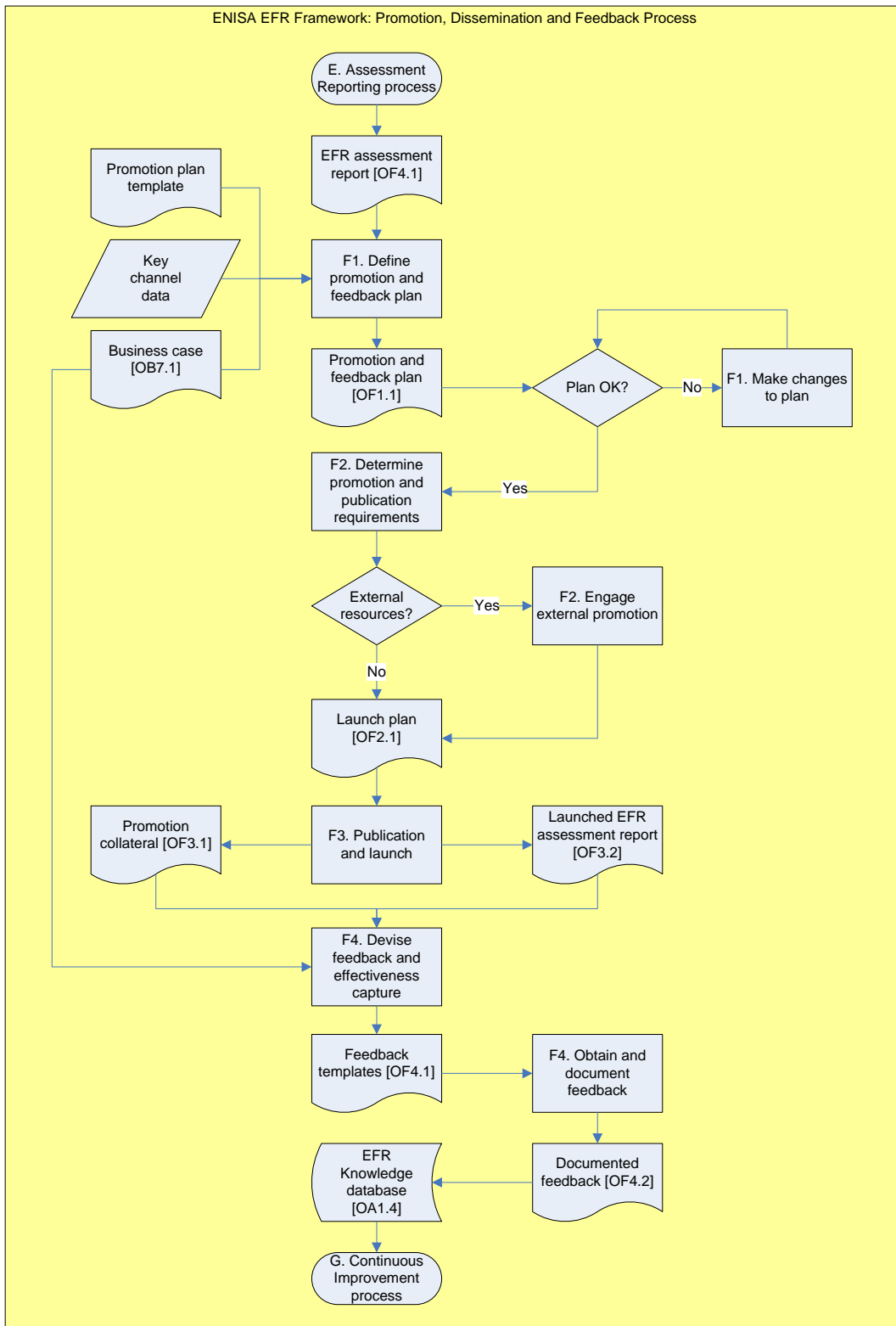Figure 7, below, shows the steps in the promotion, dissemination and feedback process.

FIGURE 7: PROMOTION, DISSEMINATION AND FEEDBACK PROCESS FLOW DIAGRAM

3.6.3 PROCESS DESCRIPTION TABLE

In the table below, the first column shows the steps of the process, as outlined in the process flow diagram above. The second column shows the essential inputs required by the steps. The third column is an outline description of the procedures that take place in the steps; each procedure is numbered. The fourth column indicates the most important outputs from the steps; each output is given a unique reference number (e.g. OA1.1), as these outputs will form inputs into other steps in this process, or other processes. The final column suggests those who will contribute to the steps.

Step	Input	Description	Output	Contributors
F1. Define promotion and feedback plan	Data about key communication channels. Business case [OB7.1]. Promotion plan template Final report version [OG4.1	1. An individual is designated as responsible for the promotion dissemination and feedback plan (either the report owner (project manager), or another member of the ENISA staff). 2. A promotion plan template is devised, including sections about: communications channels; launch plans and publicity; policy on printed and downloaded versions of the report; policy on extracts from the report; timing of launch; policy on gathering feedback; objectives for success in take-up and effectiveness. 3. The template is populated by the promotion, dissemination and feedback owner, using data from the report itself and the business case and information about ENISA's key communication channels. 4. The promotion plan is submitted to ENISA senior management for approval (senior management may consult the PSG or Management Board if appropriate). 5. Any changes to the plan, required by senior management (or the PSG or Management Board),	Promotion plan [OF1.1]	ENISA staff. Promotion, dissemination and feedback owner. ENISA management. PSG and Management Board if appropriate

Step	Input	Description	Output	Contributors
		are made. 6. The promotion plan is passed to step F2.		
F2. Determine launch requirements	Promotion plan [OF1.1]	1. Using the promotion plan the promotion dissemination and feedback owner determines the resources required for launch of the report. 2. If external promotion resources are required, the promotion dissemination and feedback owner will be responsible for engaging these and ensuring the quality of their output. 3. The promotion dissemination and feedback owner ensures that all resources are in place and available for the publication and launch of the report on the designated launch date. 4. The promotion dissemination and feedback owner documents a plan with details of responsibilities and timing for the launch and publicity and communications surrounding it. 5. The launch plan is passed to step F3.	Launch plan [OF1.1] to next step.	Promotion dissemination and feedback owner. External promotion resources (if appropriate).
F3. Launch EFR assessment report	Launch plan [OG1.1]	1. The promotion dissemination and feedback owner ensures that all resources designated in the launch plan are aware of their roles and responsibilities in relation to the report's launch and promotion. 2. The promotion dissemination and feedback owner ensures that the launch method and technology (usually the ENISA website) is appropriately sized to cope with the expected launch traffic.	Promotion collateral [OF3.1] and launched report [OF3.2] to next step	Promotion dissemination and feedback owner. ENISA staff. External promotion resources (if appropriate).

Step	Input	Description	Output	Contributors
		3. The promotion dissemination and feedback owner ensures that all collateral (e.g.: printed versions of the report, abstracts, FAQs and publicity material) is available as required.		
		4. The promotion dissemination and feedback owner ensures that the report is launched as described in the plan, that all appropriate communication channels are used to notify interested parties of the launch, that collateral is distributed as required and that publicity events take place as planned.		
		5. Following launch, the report and collateral material are passed to step F4.		
F4. Feedback and effectiveness	Promotion collateral [OF3.1]. Launched report [OF3.2]. Business case [OB7.1] Feedback templates.	1. Templates are devised to gather feedback on the report and on the operation of the EFR Framework during report production. 2. As indicated in the business plan, mechanisms are agreed on methods of measuring uptake of the report (e.g. number of downloads, number of citations in other publications). 3. Promotion dissemination and feedback owner populates templates with data specific to the published assessment report and collateral and communicated to appropriate recipients, as indicated in the business plan. 4. Promotion dissemination and feedback owner conducts interviews, to gather feedback, if appropriate, as indicated in the	Feedback templates [OF4.1]. Documented feedback [OF4.2] to process G.	Promotion dissemination and feedback owner. Subject matter experts. EFR Stakeholder Forum. Report readers and users.

Step	Input	Description	Output	Contributors
		business plan.		
		5. Promotion dissemination and feedback owner gathers, analyses and documents data from uptake measurements, returned templates and interviews.		
		6.Documented, analysed data is stored in the EFR knowledge database and passed to the Continuous Improvement process.		

TABLE 6: PROMOTION, DISSEMINATION AND FEEDBACK PROCESS DESCRIPTION

3.6.4 TECHNOLOGY AND TOOLS

The following technology and tools are used in this process:

- A web-based portal, hosted on the ENISA website.
- An EFR assessment business case template.
- An EFR assessment report template.
- A promotion plan template.
- A launch plan template.
- Feedback templates.
- Measurement of downloads, citations of report etc.

3.7 G. CONTINUOUS IMPROVEMENT

The purpose of this process is to ensure that the EFR assessment reports produced by the EFR Framework achieve a consistently high quality and meet the objective of engaging with target audiences to alert them to EFR issues in a realistic and clear way; enabling them, where necessary and appropriate, to take management and mitigation action. The process does this by assessing feedback data, and identifying both positive elements and areas for improvement in both reports and the Framework. The process uses measurements of report effectiveness to ensure that the report has met its initial business case, for example in terms of reaching the identified target audience. The process reports on feedback and effectiveness and ensures that changes are made to the Framework, where required. The process also ensures that future reports take into account the feedback received. Where necessary and appropriate, the process also identifies the timing, content, participants and recipients for follow-up reports and other activities, such as workshops. The process ensures that these activities are conducted in a timely and effective fashion and that follow-up reports are documented and disseminated, where appropriate.

3.7.1 OBJECTIVES

The objectives of the continuous improvement process are as follows:

- Assess feedback and effectiveness measurements to understand usefulness of the report
- Capture expertise and knowledge for future reports
- Identify appropriate changes that may be required to the Framework.
- Identify related follow-up reports and activities to extend the value of the report.

3.7.2 PROCESS STEPS

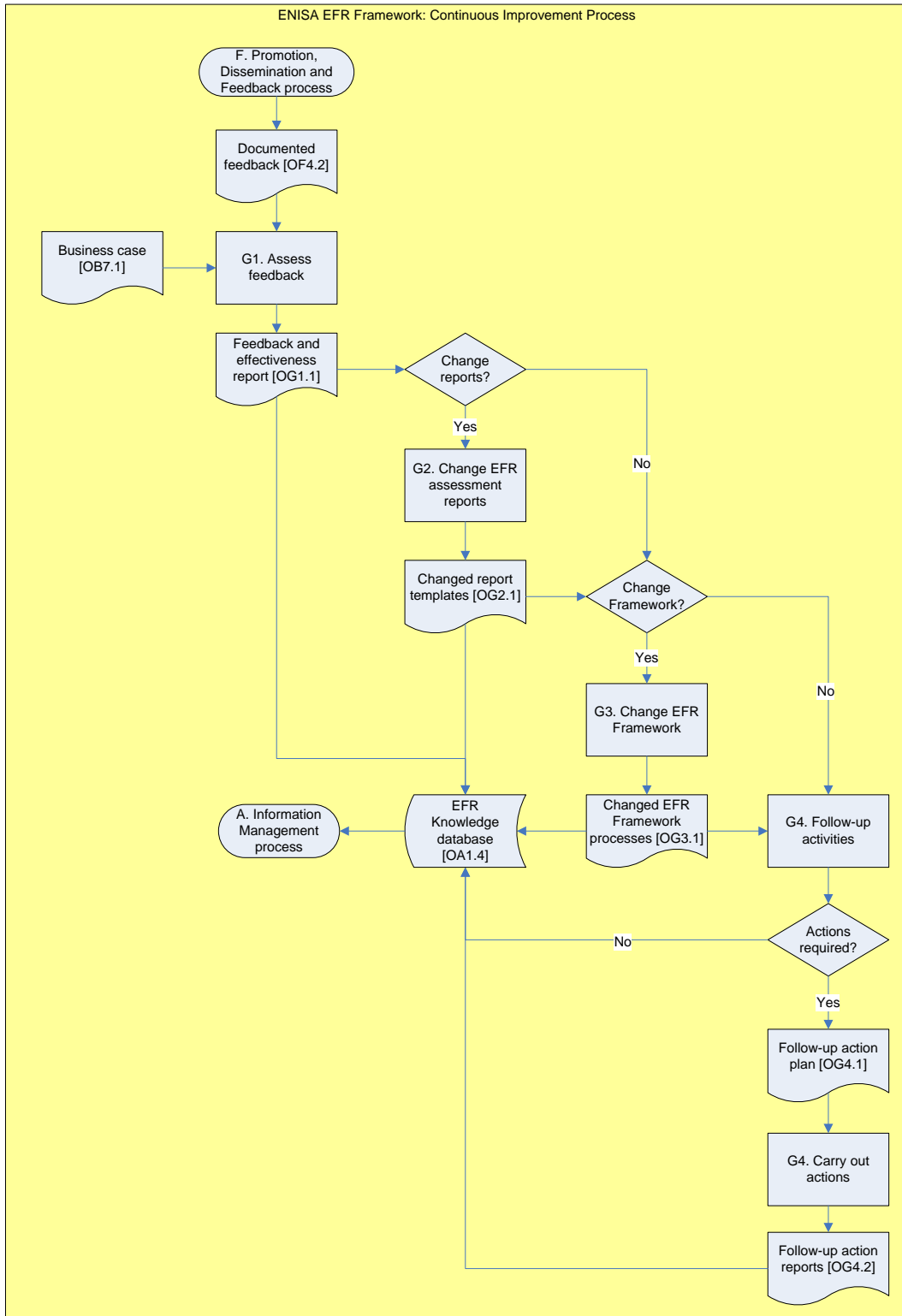Figure 8 below, shows the steps in the continuous improvement process.

FIGURE 8: CONTINUOUS IMPROVEMENT PROCESS FLOW DIAGRAM

3.7.3 PROCESS DESCRIPTION TABLE

In the table below, the first column shows the steps of the process, as outlined in the process flow diagram above. The second column shows the essential inputs required by the steps. The third column is an outline description of the procedures that take place in the steps; each procedure is numbered. The fourth column indicates the most important outputs from the steps; each output is given a unique reference number (e.g. OA1.1), as these outputs will form inputs into other steps in this process, or other processes. The final column suggests those who will contribute to the steps.

Step	Input	Description	Output	Contributors
G1. Assess feedback	Documented feedback [OF4.1]. Business case [OB7.1] Feedback report template.	1. An individual is designated as being responsible for continuous improvement of the EFR Framework. This role requires continuous attention, rather than being active only during the production of an assessment report. 2. A template is devised for reporting feedback and effectiveness of assessment reports to ENISA senior management and the PSG and Management Board where appropriate. 3. After an agreed interval following publication of the report (three months for example), the continuous improvement owner uses the analysed, documented feedback and the business case to write a report describing the positive and negative aspects of the feedback received and of the measurement of the report's effectiveness. 4. If necessary, the report should contain recommendations for changes to report structure etc. and/or to Framework processes and for follow-up actions. 5. The report is passed to step G2.	Feedback report [OG1.1] to ENISA management and PSG and Management Board where appropriate, to next step and to the EFR knowledge database [OA1.4]..	Continuous improvement owner. ENISA management. PSG and Management Board where appropriate.

Step	Input	Description	Output	Contributors
G2. EFR Assessment report changes	Feedback report [OG1.1]	1. The continuous improvement owner discusses with ENISA management recommended changes to the EFR assessment report structure, launch or promotion. 2. If necessary and appropriate, resources are allocated to make the identified and agreed changes. 3. The changes are made and information concerning them is fed back into the EFR knowledge database and thus into the Information Management process.	Changes to reporting systems [OG2.1] to EFR knowledge database [OA1.4] and to A. Information Management process.	Continuous improvement owner. ENISA management. ENISA staff.
G3. EFR Framework process changes	Feedback report [OG1.1]	1. The continuous improvement owner discusses with ENISA management lessons learned about the operation of the EFR Framework processes recommended changes to these. 2. If necessary and appropriate, resources are allocated to make the identified and agreed changes. 3. The changes are made and information concerning them is fed back into the EFR knowledge database and thus into the Information Management process.	Changes to EFR Framework processes [OG3.1] to EFR knowledge database [OA1.4] and to A. Information Management process.	Continuous improvement owner. ENISA management. ENISA staff.

Step	Input	Description	Output	Contributors
G4. Follow-up activities	Feedback report [OG1.1]. Business case [OB7.1] Follow-up plan template.	1. The continuous improvement owner discusses with ENISA management the requirement for follow-up actions (e.g. additional workshops or reports), the content and participants in these and their timing. 2. If appropriate, an individual is designated with responsibility for carrying out the follow-up actions. 3. A follow-up plan template is devised containing fields concerning follow-up reports, workshops, timing, participants etc. 4. The designated individual populates the follow-up plan template with appropriate data and agrees this with ENISA management. 5. The actions described in the plan are carried out. 6. Follow-up reports are documented and sent to the EFR knowledge database and A. Information Management process.	Follow-up plan [OG4.1] and follow-up report [OG4.2] to EFR Knowledge database [OA1.4], and process A: Information Management.	Continuous improvement owner. ENISA management. ENISA staff.

TABLE 7: CONTINUOUS IMPROVEMENT PROCESS DESCRIPTION

3.7.4 TECHNOLOGY AND TOOLS

The following technology and tools are used in this process:

- A web-based portal, hosted on the ENISA website.
- An EFR assessment business case template (annex C).
- A feedback report template.
- The EFR knowledge database.

4 ANNEX A: EFR FRAMEWORK, SUPPORTING DOCUMENTATION

- Emerging and Future Risks Workflow (Final). Jeremy Burton, Pete Burnap and Anas Tawileh. [Undated].
- Emerging and Future Risks Executable Workflow UML Description. Technical department of ENISA risk management in cooperation with the: VTT Technical Research Centre of Finland. November 2008.
- EFR Framework Handbook. Technical department of ENISA risk management in cooperation with Atos Origin, Spain. [Draft]. March 2009.
- EFR Collaboration Platform, User Guide. Technical department of ENISA risk management in cooperation with Atos Origin, Spain. [Draft]. September 2009.

5 ANNEX B: CALL FOR SCENARIO PROPOSALS TEMPLATE

Submission Details

Those interested in submitting a proposal for an emerging and future risk assessment are asked to complete the following online submission template.

Proposal related to (select one):

☐ Topic Area 1

☐ Topic Area 2

☐ Topic Area 3 etc.

Short, descriptive title for the proposal [e.g. "Cyberbullying in 2012"]

Brief outline of the proposed scenario (Up to 500 Words)

An assessment of the significance of the technology and its application, as outlined in the proposed scenario

Target audience(s) for the assessment report [e.g. "legislators"]

Brief description of the benefits likely to emerge from this assessment report

Suggestions of individuals who might be willing to support and contribute to this assessment

Contact details of the individual responsible for submitting this proposal

Title (Dr., Mr., Ms., Miss, Mrs)	
First Name	
Last Name	
Job title	
Organisation (*include also a brief description*)	
Address	
Phone	
Email	

To be eligible for consideration, proposals should be submitted by:

- Member States (including any public organization representing the Member State's interest)
- European Commission and other EU Institutions
- ENISA Management Board
- ENISA Permanent Stakeholders Group
- ENISA National Liaison Officers (see list)
- Any other public stakeholder (e.g. consumer organisations, associations etc.)
- Industry.

It should be noted that the assessment will not consider proprietary technologies and, as an ENISA deliverable, will become public material published on the ENISA web-site.

The deadline for proposals is: [insert date].

Selection Process

Eligible proposals will be evaluated for each category, according to the following criteria:

- Completeness of the submission.
- Relevance and adequacy of the proposed scenario.
- Evidence of benefit from carrying out the assessment.
- Nature of the identified target audience.

We hope to select up to 20 proposals on the basis of these criteria.

The selected proposals will be submitted (anonymously) to the Permanent Stakeholders' Group; who will be asked to rank them in order of their potential to generate significant and valuable assessment reports.

The top two proposals in ranked order will be selected to become emerging and future risk assessment projects for [insert year].

For further information please contact us at: RiskManagement@enisa.europa.eu

6 ANNEX C: EFR ASSESSMENT BUSINESS CASE TEMPLATE

Title of the Scenario

Scope of the assessment

Target audience

Objectives and outcomes expected from publication (including benefits for target audience)

Associated work and other initiatives

Indication of resources required

7 ANNEX D: SCENARIO BUILDING AND ANALYSIS TEMPLATE

Structure of the template

The template is structured as follows:

- Introductory part, where a general overview and the background to the scenario is provided

- The Scenario description, including the following information:
  - *Scenario type*: explorative (*what can happen*) or predictive (*what will happen*)
  - *Scenario raw description*: this is where the scenario is described in free text. The intended text in italics provides more technical information on how certain activities are performed. These details are not necessarily those of which actors are fully aware as they happen in the background.
  - *Assumptions*: Any assumptions made while formulating the scenario.

- Analysing the scenario **–** This section contains a number of fields, with information we would like to know to proceed with the risk assessment as a next step.

- A Glossary – Lists the abbreviations used throughout the text, where important terms like "threats", "vulnerabilities", etc. are defined.

- Other information where more information not specified in the table above could be specified, or figures and pictures added, etc.

- References, where all references used for completion of the tables should be listed.

[Title of the scenario]

Type of scenario *["predictive" or "explorative" to indicate the nature of the scenario]*	
Raw description of scenario *[who does what or what happens. The intended text in italics provides more technical information on how certain activities are performed. These details are not necessarily fully understood by the actors and they happen in the background.]*	
Assumptions *[any assumptions made while writing the scenario flow. The assumptions' field is a place holder for information that may concern generic information about relevant legislation, devices, applications, participants, etc.]*	

Analysing the scenario	
Timeframe *[when the scenario takes place]*	
Location *[where: Home / work / public*	

space...]	
Actors *[who: entities relevant to the scenario and describe their roles and goals. These most include humans and organisations but not IT systems.]*	•
Technologies / devices *[technologies / devices used in the scenario]*	•
Applications *[applications used in the scenario]*	•
Data *[information that is collected, or flows through the network, or is being stored and further processed]*	
Drivers	

[key drivers behind the scenario: socio-economic, political, environmental or personal motivation...]	

Glossary / Aid

Other information

[You may provide here other information you consider relevant and cannot be covered in the fields above, e.g. images etc.]

References

8 ANNEX E: RISK ASSESSMENT TEMPLATE

A. Assets
[tangible or intangible: any devices, technologies, applications, processes, data of value]

ID	Asset	Description or reference to above described elements	Owner *[involved actors / organisations]*	Perceived Asset Value
Intangible				
A1.				
A2.				
Tangible				
A3.				
A4.				

B. Vulnerabilities
[List of the vulnerabilities of the tangible / intangible assets with their value]

No.	Vulnerability Description	Vulnerability Value
V1.		
V2.		
V3.		
V4.		

NOTE: **When you make any change / addition to the vulnerabilities, do not forget to update the next table (the mapping between assets and vulnerabilities)**!

C. Assets and Vulnerability Mapping *[identifying vulnerabilities from the list above for each asset; note that vulnerability value might differ from asset to asset]*

Asset ID	Assets	Vulnerability Description	Vulnerability Value
A1			

D. Threats
[List of the threats with their value]

ID	Threat Description	Threat Value
T1.		
T2.		

Other information

[You may provide here other information you consider relevant and cannot be covered in the fields above, e.g. images etc.]

References