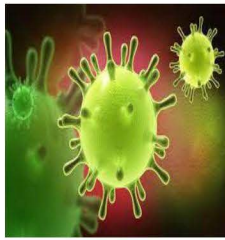


The Scottish Risk Assessment

End of Phase 2 Report

March 2017



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Introduction

This report provides an overview of progress on development of the second set of five risks for the Scottish Risk Assessment (SRA).

Background

In January 2015 the Deputy First Minister asked officials in Resilience Division, Scottish Government, to develop a SRA, taking forward the work incrementally within the existing budget and staffing profile, building on existing work. The SRA is being developed based on the sound methodology of the UK National Risk Assessment.

The SRA will ensure there is an overarching Scottish perspective to risk which will enable us to improve how we protect our people, resources and assets, how we prevent and prepare for such incidents and how we respond to and recover from them should they occur. The SRA will be an evidence-based resource to inform multi-agency efforts to prevent, mitigate, and respond to disruptive challenges.

The work of the SRA will also enhance Scotland's resilience partnerships' existing risk work by ensuring national level information is provided for regional planning purposes.

The development of a SRA is at the forefront of driving a change in the culture toward risk, and risk ownership, across the Scottish Government. It represents a real improvement in the way we approach risk at a National level and how policy leads within the Scottish Government and its agencies own and understand the disruptive challenges Scotland may face.

This project contributes to all five of the Scottish Strategic Objectives, providing a good-practice process to help us protect the country from a wide range of potential disruptive challenges. If disruptive challenges are handled effectively, societies can recover quickly, sometimes even improving on their previous state.

The SRA will focus on natural hazards and accidents, as this is where the greatest differences are when Scotland is compared to the UK, and most aspects of counter terrorism are reserved to the UK Government. An assessment of terrorist threats will not be included the SRA, however, a narrative on terrorist threats could be included to ensure a full range of risks is covered.

The first iteration of the SRA will be developed by July 2017 and will comprise of ten risk scenarios.

Progress in Phase 2

The work has been divided into a pilot and three phases:

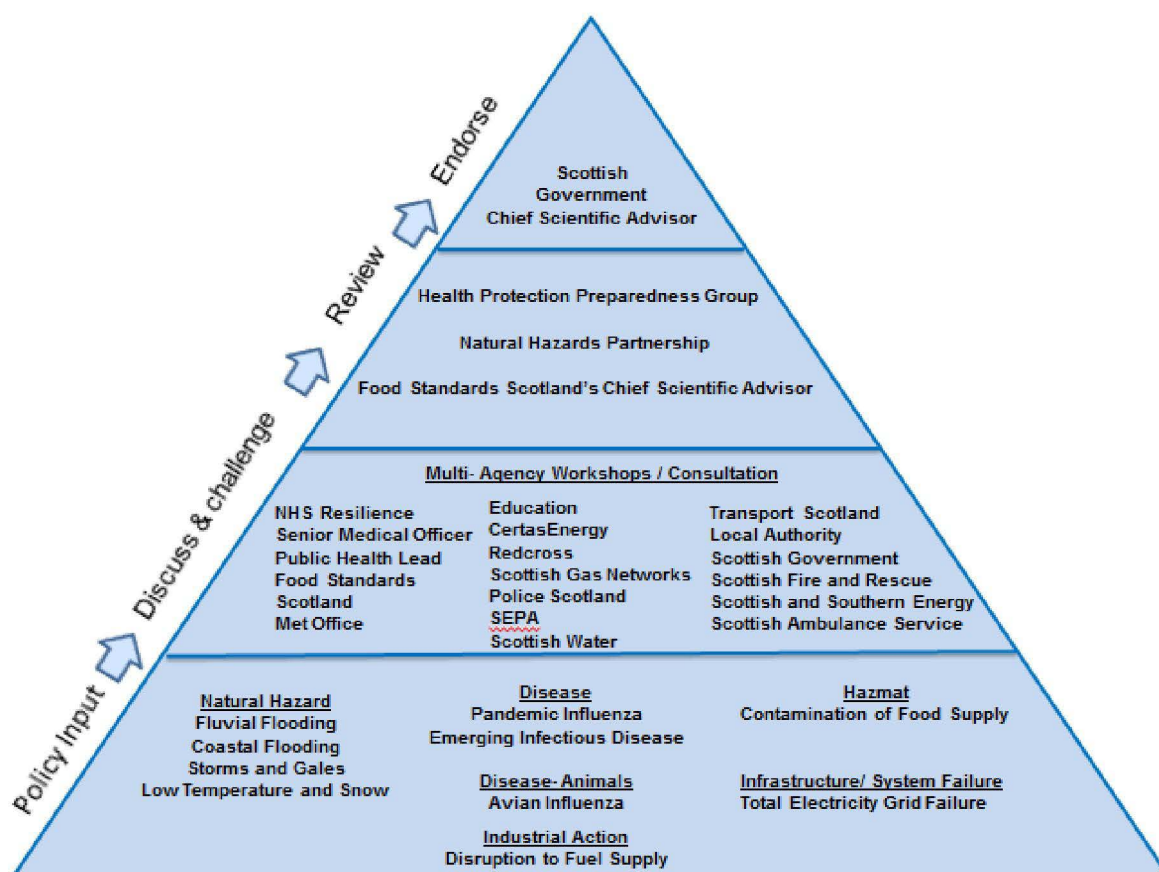
- **Project initiation and the Pilot** – Identifying risks, adapting UK NRA methodology, and testing the workshop approach using the first risk scenario.
- **Phase 1** – Developing a further four risk scenarios, refining the methodology and workshop approach.
- **Phase 2** – Developing a further five risk scenarios.
- **Phase 3** – Refining the methodology, review and verification of all risks, sign off, and publication.

We are now at the end of Phase 2 and have so far achieved the following project milestones:

- **The development and assessment of five Scottish-focussed scenarios** – as described on pages 7-10.
- **Stakeholder Workshop** – In November 2016 we held a final consequence-focussed workshop taking forward improvements from the previous workshop in July 2016. A particular improvement was the use of ResilienceDirect to securely share workshop materials in advance. The workshop was well attended by a range of representatives from utilities companies, responder organisations, local authorities, national agencies and Scottish Government policy area. We received very positive feedback, as described in the evaluation report for this workshop at **ANNEX A**. Delegates described the workshop as a good opportunity to learn much more about lesser known risk such as Emerging Infectious Diseases and said it was interesting listening to different views and impacts on other sectors and organisations. In particular, some attendees commented that the workshop provided a very healthy ‘sense-check’ to assumptions made by policy leads and allowed them the opportunity to share their approaches and assumptions.
- **Refining and testing of the Economic Tool** - In line with adopting and adapting the UK National Risk Assessment methodology to develop the Scottish Risk Assessment we took the Economic Tool developed by cabinet office and HM Treasury and worked with Scottish Government Economists and Analysts to scale down the aspects of the tool to make it more appropriate for a Scotland level assessment. The revised Economic tool was tested with policy leads across all risk assessments in order to ensure it was fit for purpose. The testing provided insight into both the benefits and limitations of the tool. It is helpful at providing a high-level picture of the economic impact but has limitations relating to some of the assumptions made within the model and there are challenges around the availability of data required to complete it. We will contribute our findings into future improvements to the model and need to be mindful of the fact that this is not an exact science. However, overall, using the model is useful, as it provides a

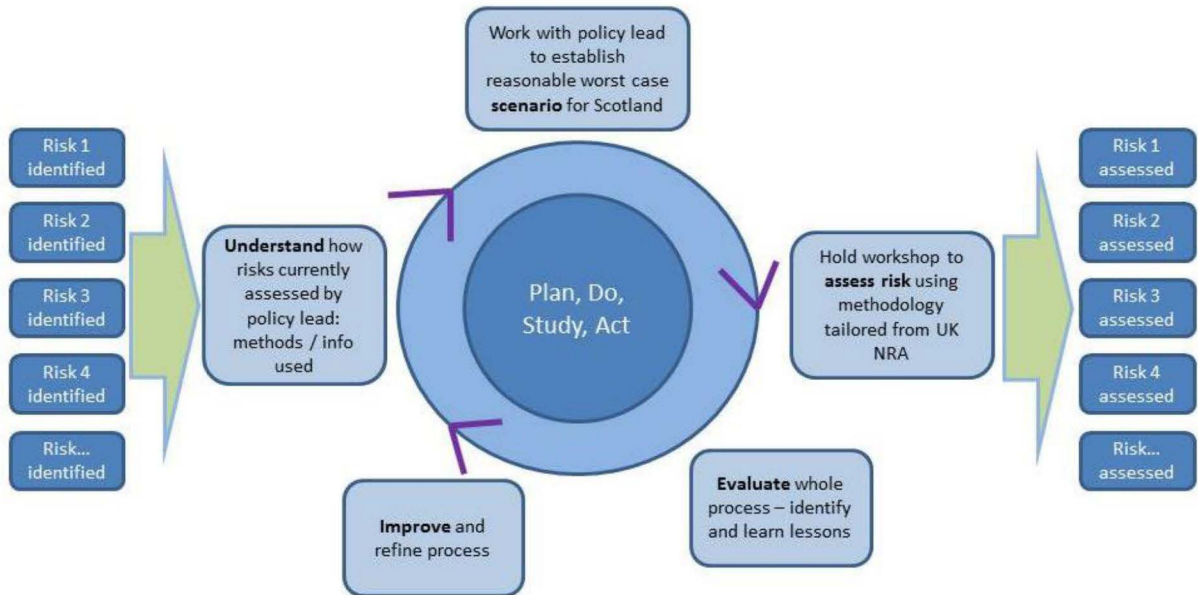
certain level of objectiveness and robustness into an otherwise subjective assessment of economic impact.

- A model for verification and endorsement** – A key objective for the SRA is that the individual risk assessments are robust and evidence based. In order to give assurance to this we have developed a process for challenge of the individual risk assessments and endorsement of the SRA development process. The model that we have developed provides the opportunity for academics and scientists, such as the Natural Hazards Partnership, to review the individual risk assessments and provide further guidance to fill any gaps in the evidence. Following this the Scottish Government Chief Scientific Advisor (CSA) will review the SRA process to help ensure that science has been considered and evidence analysed at appropriate times during the process. Subsequently the CSA will advise of improvements that can be made to the process and future iterations of the risk assessment. The following diagram shows the range of stakeholders we have engaged with at various points and how this fits with the model for verification and endorsement:



How We Have Achieved This

We are following improvement principles in developing the SRA, learning, refining and adapting throughout the project. The following diagram summarises how we are using these principles to shape the process we are following:



The project is being managed using a flexible and agile approach, ensuring key milestones are planned and risks are mitigated against. Engagement from across the Scottish Government, its agencies and responder organisations has continued to be very good. Policy colleagues in, Resilient Essential Services, Health Protection, The Met Office, Food Standards Scotland, and the Scottish Environmental Protection Agency (SEPA) have produced the second group of risks.

Provisional Risk Assessments

The output of this work is the following provisional risk assessments. These scenarios were developed by lead policy teams and assessed for their economic impact, the number of fatalities and casualties that would result and the disruption to society they would cause.

Further work is planned in Phase 3 of the project to validate these results and allow the scenarios to be assessed for the psychological impact they are likely to have on society – this is particularly important and is an area we have not undertaken before. We are working with academics and social psychologists that are a subset of the Behavioural Science Expert Group that advises Cabinet Office to undertake this aspect of the work.

Impact	5					
	4			Total Electricity Grid Failure		
	3			Emerging Infectious Disease	Storms and Gales	Contamination of Food Supply
	2			Coastal Flooding		
	1					
			1	2	3	4
Likelihood						

Scottish Risk Assessment Risk Matrix

Four of the risks developed in this phase have been assessed as high priority (amber in the matrix above) and one risk has been assessed as medium priority (yellow in the matrix above). On the following pages we have summarised the provisional risk assessments in terms of their likelihood and impact. More detail on the likelihood and impact scales used in these assessments can be found at **ANNEX B**. Further detail on any of these risks can be provided by the Risk Team and/or lead policy area for each risk.

Industrial – Total Electricity Grid Failure (Resilient Essential Services, SG)

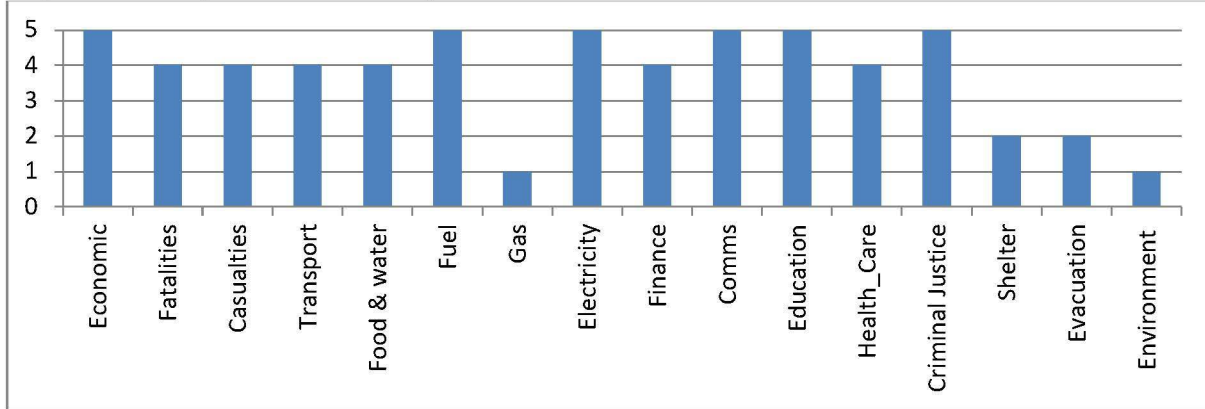
Likelihood – 3 Impacts – 4

Outcome Description

A total national blackout due to the loss of the GB National Electricity Transmission System caused by damage to or technical failure of the transmission network.

Impact	5	Yellow	Orange	Red	Red	Red
	4	Yellow	Orange	Red	Red	Red
	3	Yellow	Yellow	Orange	Orange	Red
	2	Green	Yellow	Yellow	Orange	Orange
	1	Green	Green	Yellow	Yellow	Yellow
		1	2	3	4	5
		Likelihood				

Impact Detail (on a scale of 0-5)



Severe Weather – Storms and Gales (Met Office)

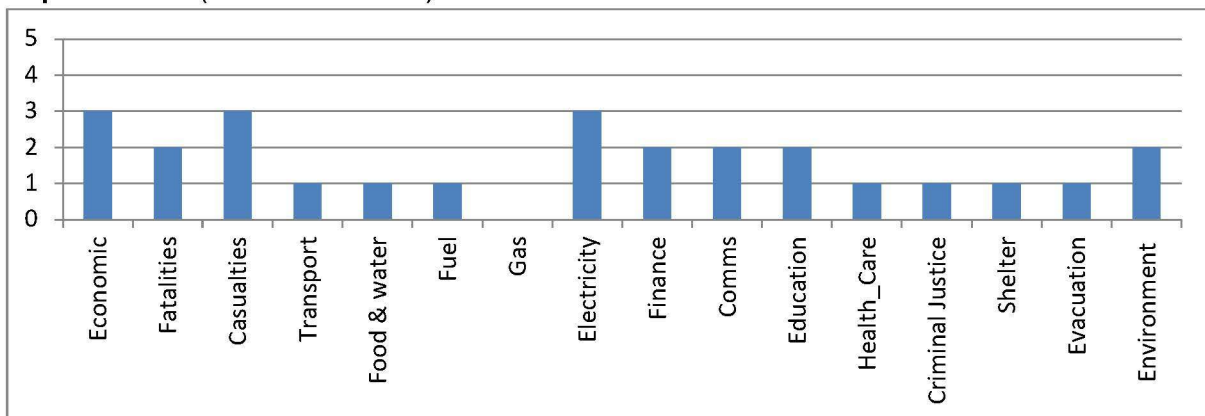
Likelihood – 4 Impacts – 3

Outcome Description

Storm force winds affecting multiple regions of Scotland for at least 6 hours during a working day. Most inland, lowland areas experience mean speeds in excess of 55 mph with gusts in excess of 85 mph. Although the storm will be over in less than a day, disruption to infrastructure including power, communications, transport networks, homes and businesses could last for 1-4 days and for in excess of 5 days in remote, rural locations.

Impact	5	Yellow	Orange	Red	Red	Red
	4	Yellow	Orange	Orange	Red	Red
	3	Yellow	Yellow	Orange	Red	Red
	2	Green	Yellow	Yellow	Orange	Orange
	1	Green	Green	Yellow	Yellow	Yellow
		1	2	3	4	5
		Likelihood				

Impact Detail (on a scale of 0-5)



Human Health – Emerging Infectious Disease (Health Protection, SG)

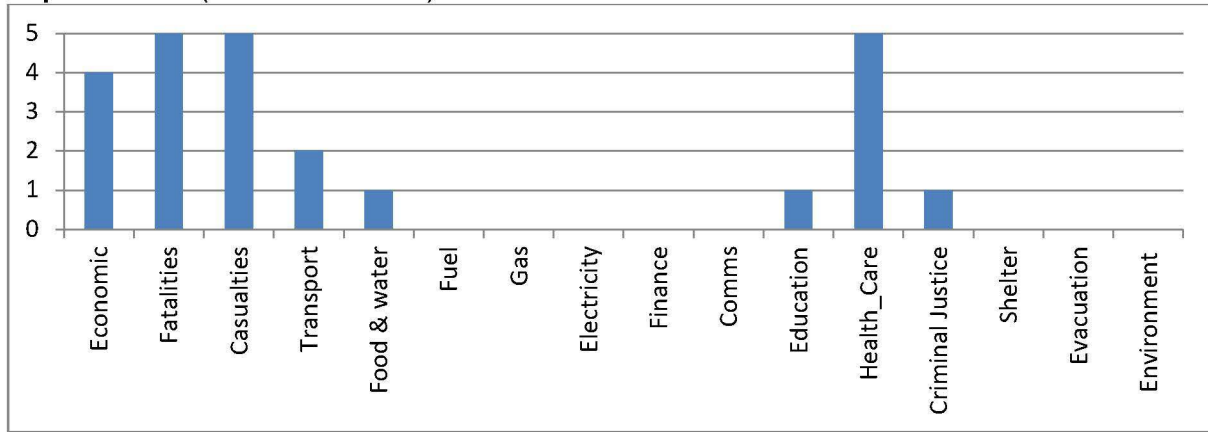
Likelihood – 4 Impacts – 3

Outcome Description

An emerging infectious disease is one that has appeared in a population for the first time or may already exist but its incidence is rapidly increasing. The potential impact will depend on the organism and route of transmission, and whether there are effective antibiotics/antiviral and vaccines.

Impact	5	Yellow	Orange	Red	Red	Red
	4	Yellow	Orange	Orange	Red	Red
	3	Yellow	Yellow	Orange	Red (★)	Red
	2	Green	Yellow	Yellow	Orange	Orange
	1	Green	Green	Yellow	Yellow	Yellow
		1	2	3	4	5
		Likelihood				

Impact Detail (on a scale of 0-5)



Contamination of Food Supply (Food Standards Scotland)

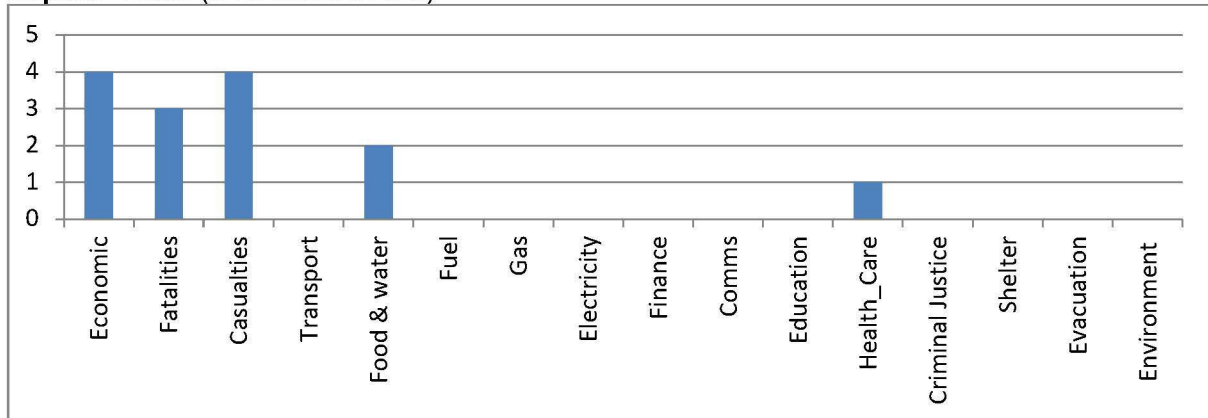
Likelihood – 4 Impacts – 3

Outcome Description

A major contamination incident involving a microbiological pathogen in the food chain causing illness, hospitalisation and possible fatalities in a moderate to large number of people over a period of a few days to weeks to identify the contaminant and months for the response.

Impact	5	Yellow	Orange	Red	Red	Red
	4	Yellow	Orange	Orange	Red (★)	Red
	3	Yellow	Yellow	Orange	Red	Red
	2	Green	Yellow	Yellow	Orange	Orange
	1	Green	Green	Yellow	Yellow	Yellow
		1	2	3	4	5
		Likelihood				

Impact Detail (on a scale of 0-5)



Flooding - Coastal Flooding (SEPA)

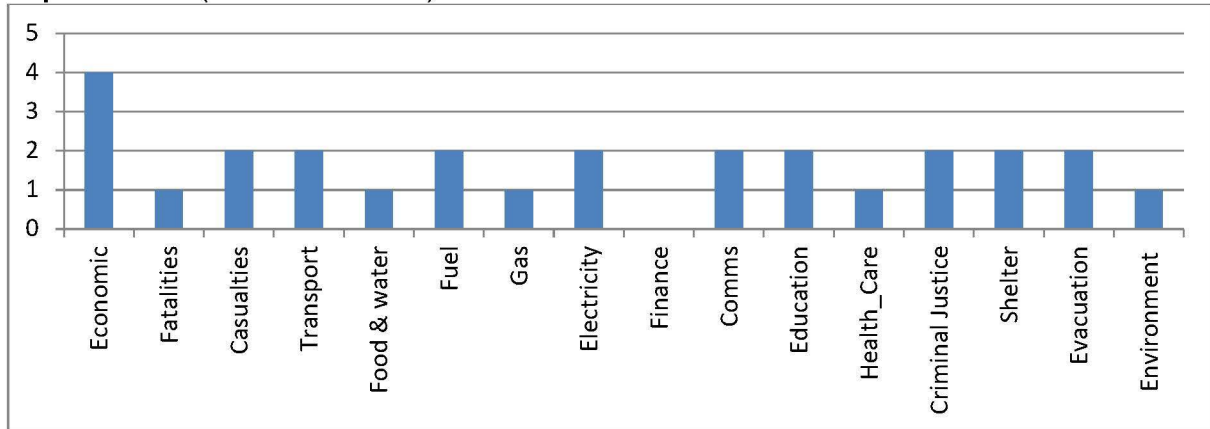
Likelihood – 3 Impacts – 2

Outcome Description

Several deep low pressure systems situated in the North Sea, the deepest over Norway. The position of these low pressure systems promote a large storm surge event, particularly in eastern Scotland. The resulting coastal flooding would cause widespread disruption, including; flooding to hundreds of homes and businesses leading to evacuations in many areas, loss of power, road and rail links affected by floodwater perhaps leading to damage of key infrastructure and isolation of vulnerable residents and/or communities.

Impact	5					
	4					
	3					
	2			★		
	1					
		1	2	3	4	5
		Likelihood				

Impact Detail (on a scale of 0-5)



The Next Phase

As we move into **Phase 3** of the project we will be undertaking the following activities over the next five months:

Continue to share learning so far:

- Share learning from the five latest risk assessments with Regional Resilience Partnerships to help improve their regional risk and preparedness work, using ResilienceDirect to disseminate findings.
- We are holding a multi-agency workshop at the end of March to describe findings to date, discuss future options and update stakeholders on how this works links to the UK's National Risk Assessment.

Finalise the SRA:

- Further refine the SRA methodology, including working with Cabinet Office's behavioural sciences group to determine how to assess psychological impacts of each risk.
- Review and challenge of the SRA Hazards by the Natural Hazards Partnership.
- Endorsement of the SRA development process by the Scottish Government Chief Scientific Advisor.
- Update Scottish Ministers later in Spring 2017.
- Closing out the SRA Development project and developing options for establishing a permanent process for the SRA.

Scottish Risk Assessment Workshop, 28 November 2016, Evaluation Report

Introduction

The Scottish Risk Assessment (SRA) project is to develop a Scottish risk assessment process that is:

- Based on robust UK National Risk Assessment's (UK NRA) methodology
- Tailored to needs of Scotland
- Looking 5 years ahead and
- Focussed on natural hazards and accidents that might affect Scotland (not malicious threats).

The approach to developing the SRA is:

- Being collaborative
- Working with experts
- Learning and improving as we go – using improvement principles

As part of this collaborative approach a workshop was held on 28 November 2016 at Atlantic Quay, Glasgow. The workshop attendees were asked to consider impacts for four new scenarios in the following areas:

- Severe Storms and Gales
- Failure of the Electricity Network
- Food Contamination
- Emerging Infectious Disease

The workshop focused on validating and providing challenge to the impact assessments made by the risk leads. The attendees were asked to consider the impact the scenario would have on Scotland, specifically

- the social disruption it would cause (including the impact on access to health care, transport, essential services, education, care for people and the environment) and
- the fatalities and casualties that would result.

In an effort to ensure the workshop achieved its aims an evaluation form was issued to the attendees for comments and reactions about the workshop.

Results

A total of 16 evaluation forms were returned which have been analysed to prepare the report.

Scottish Risk Assessment Workshop Evaluation Form Results					
Rating	Excellent	Good	Average	Fair	Poor
Presentation and facilitation of seminar	6	10			
Group Work/Exercises	4	12			
Supporting Materials	6	10			
Venue	4	11	1		
Overall Workshop	4	12			
Total	24	55	1		

Q1. Presentation and facilitation of seminar

A very high score with 37.5% of the attendees rating it as excellent and 62.5% marking it as good.

The audience liked how it was “Kept simple and straight forward”, “Set the scene” for the day and felt it was “All very efficiently done”.

Q2. Group Work/Exercises

A good score to this question as 25% rated this part of the day as excellent with the other 75% marking it as good.

It was a “Good opportunity to participate” and the “Hands on approach worked really well”.

It was also commented that there was a very “Positive atmosphere” at the workshop.

Q3. Supporting Materials

Another very well scored answer with 37.5% rating this as excellent and the other 62.5% rating as good and in particular they found it very helpful to have the background “Sit Reps” beforehand.

Q4. Venue

No issues with the venue with 15 out of the 16 attendees marking it as either excellent or good. Only one person gave an average score.

Q5. Overall Workshop

Very positive with 100% of the audience rating the workshop as either excellent (25%) or good (75%).

It was felt that the day was full of “Relevant discussions which will help ensure plans are regularly tested”.

It was also noted that the event was “Well run and organised”.

Feedback

Attendees provided the following comments:

- Very good opportunity to learn much more about lesser known risk such as Infectious Disease.
- Interesting listening to different views and impacts on areas/organisations. Further work required on emerging threats.
- Very difficult to look at Scotland wide scenarios.
- Much work has been undertaken in the 9 devolved areas. Sector resilience assessments have been undertaken in connection with critical infrastructure.
- Obviously regards the NRS there were issues defining the criteria, this is being taken up I understand. Uncertainty was not directly handled in the assessments today-perhaps this is being dealt with elsewhere?
- All SFRS Civil Contingency Officers should attend these workshops. This is due to SFRS leading on RPA process.

Conclusion

The Scottish Risk Assessment Workshop feedback received was overall very positive.

The aims of the workshop to validate and challenge the impact assessments made by the risk leads were achieved as borne out by the evidence above.

SRA Likelihood Scale and Impact Categories

Likelihood

All risks are assessed for their likelihood of occurring in Scotland in the next five years. The assessment should be based upon available data, analysis and historical evidence from Scotland and other relevant countries.

Level	Descriptor	Likelihood in every five years	Stated chance in every five years:	Equals one event in every:
1	Low	Between 0.005% and 0.05%	Between 1/20,000 and 1/2,000	10,000 to 100,000 years
2	Medium-low	Between 0.05% and 0.5%	Between 1/2000 and 1/200	1000 to 10,000 years
3	Medium	Between 0.5% and 5%	Between 1/200 and 1/20	1000 to 100 years
4	Medium-high	Between 5% and 50%	Between 1/20 and 1/2	100 to 10 years
5	High	50% or more	1/2 or more	10 years or less

Impact Categories

All risks are assessed against the following impacts on a scale of 1 to 5. One being the lowest impacts and five being the highest

- **Economic impact** - this is a measure of the total net economic cost derived as a result of each incident occurring, including costs incurred up to five years post-incident.
- **Fatalities** - the number of people killed by the incident, directly or within the first year thereafter, including those that die as a result of cancellation or delay to medical treatment. The figure is calculated as the number of fatalities over and above the expected for that period
- **Casualties** - those requiring medical treatment as a result of the incident, either for chronic, acute or psychological effects
- **Social Disruption**
 - **Essential Services** - Transport; Food and Water; Fuel; Gas; Electricity; Finance; and Communications
 - **Other Factors** - Education; Access to Health Care; Judicial Disruption; Evacuation & Shelter; Judicial; and Environment.
- **Psychological impact** - consists of two elements; "Outrage" and "Perception". Public outrage at a risk aims to capture the sense of anger and indignation that erupts after an incident has occurred. A total score for Psychological Impact is calculated by averaging the Public Outrage and Public Perception of Risk scores.