Electricity Transmission Regulatory Reset

2008/09 – 2013/14

Appendix A

Jervis Consulting Report

SP AusNet
A member of Singapore Power Group

Report on Asset Risk Management Survey conducted for SP AusNet July/August 2006

Introduction

Asset risk management is an important part of the process of ensuring longer-term network performance. SP AusNet is seeking to promote greater visibility of asset risk management in the transmission segment of its business. The key aims of this initiative is:

- To allow SP AusNet to gain assurance that the quality of approaches being adopted to risk management aspects of the stewardship of its assets is at or moving towards best practice,
- To identify areas where improvement is required and the development of an action plan for moving forward.

In 2002 The Office of Gas and Electricity Markets (Ofgem), the UK Market Regulator conducted an Asset Risk Management Survey of the large electricity and gas network operators. The Survey, developed by an Ofgem consortium was "to explore the medium/long term asset risk management practices".

SP AusNet has taken the decision to use the Ofgem survey instrument to assess its current asset risk management performance and where to target improvement activities.

To achieve the desired outcomes, Jervis Consulting was asked to assist with conducting the Survey (using the Ofgem information provided by SP AusNet), to analyse the results and provide data for the development of an Action Plan.

The intent was to use a consistent approach to that used by Ofgem and to benchmark the SP AusNet results with those companies surveyed by Ofgem.

This report is the completion of the initial review and the success of this first stage is very much dependent on the company's commitment to working through the identified areas of improvements and development and implementation of a focused Action Plan to achieve the move to best practice.

The companies who participated in the Ofgem survey were:

Electricity Distribution

Aquila
LPN and EPN
Scottish and Southern Energy
SEEBAORD Power Networks
Western Power Distributors
East Midlands Electricity
Northern Electricity Distribution Network
SP Distribution plc (including SP Manweb plc)
United Utilities
Yorkshire Electricity Distribution Limited

Electricity Transmission

SP Transmission plc
National Grid
Scottish and Southern Energy

Gas Distribution and Transmission

Transco

Methodology

As mentioned above, the Ofgem Asset Risk Management Survey (provided by SP AusNet) was the instrument used in the review. The Survey uses a simple model (Figure 1 below) that is based on a number of theoretical models.

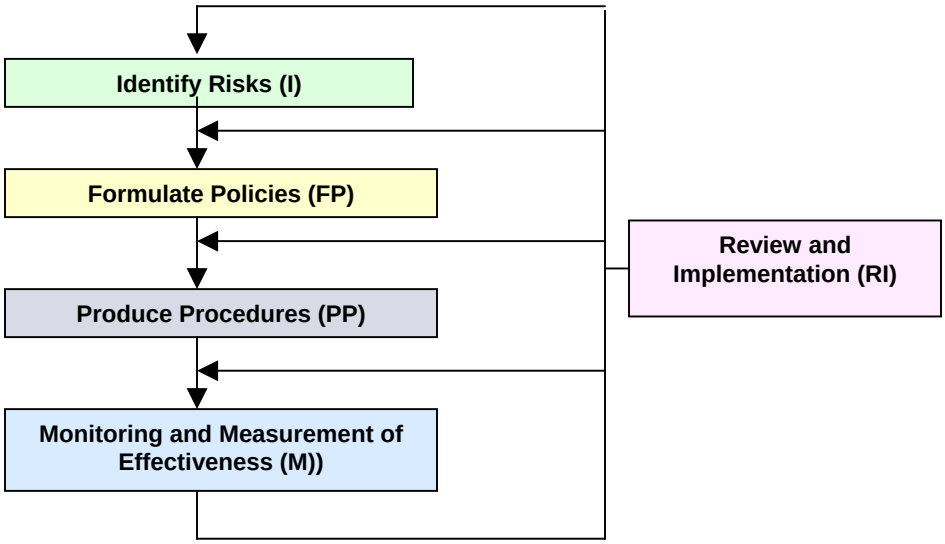


Figure 1: Asset Risk Management Survey Model

This simple high-level model, combined with the content of the questionnaire, is sufficiently robust to allow the exploration of the asset risk management process at the level required for this survey.

The questions in the Survey are structured to investigate the risk management model for the key areas of the company where asset risk activities take place. These are:

- Category A: Business Strategy and Direction
- Category B: Asset and Network Strategy
- Category C: Asset Lifecycle Management

Within each of the categories above, key topic areas were identified and a series of questions are structured to test the integration of information flows between the three categories. They are designed to check how effectively processes are being applied and how the company is monitoring and reviewing its effectiveness in order to continuously improve asset risk management techniques.

A survey questionnaire was prepared using the Ofgem document and a selected number of Network Development Managers (transmission) undertook a workshop to complete the document. Other subject experts were used to verify information provided at the workshop. The responses were then rated against the Asset Risk Management Scoring Matrix, using the evaluation matrix provided in the Ofgem documents. This then allows benchmarking with the UK companies.. The results were then reviewed and an agreed final score for each question determined.

Spider Graphs were then used to compare SP AusNet's performance to the companies in the 2002 Ofgem Report. (See Page 6 of this report)

Scoring

As mentioned previously, SP AusNet's responses to the questionnaire were assessed against the Asset Risk Management Scoring Matrix. The basis of the Scoring Matrix is summarized below:

Level of Process Development	***Guideline for extent of application***	***Points Awarded***
Process fully integrated and effective across the whole company	>90%	5 points
Process mostly in place but not shown to be fully integrated and effective across the company	76%	4 points
Process development complete to moderate extent and/or not applied to notable areas of company asset activities or locations	50%	3 Points
Process under development and/or applied to only some areas of the company asset activities or locations	25%	2 Points
Little or no evidence of process and/or limited application across company asset activities or locations	<10%	1 Point

To score the key topic areas such as Category A, B and C, the quality of the evidence provided in the response to the main question and the sub-questions was assessed. This formed an understanding of the company's asset risk management approach for that key topic areas. The final score awarded depended on both the extent and level of the risk management process and the range of application of the process across the asset types and across the organization.

The questionnaire provides a "snap-shot" of the status of asset risk management at a particular point in time. However it must be recognized that there is no single correct model for asset risk management implementation and that SP AusNet, quite rightly, determines its own priorities for its own business and customers. For example, the planning regime in Victoria provides different scenarios and results to what is expected in the survey.

Survey Results

The radar plot below shows a simple representation of SP AusNet's process position in the 18 segments of the survey. The use of the radar plot presentation allows for the rapid assimilation of multi faceted results. The benefit of using the radar plot is that it allows the reader to quickly ascertain SP AusNet's areas of greater development and the areas where improvement opportunities exist.

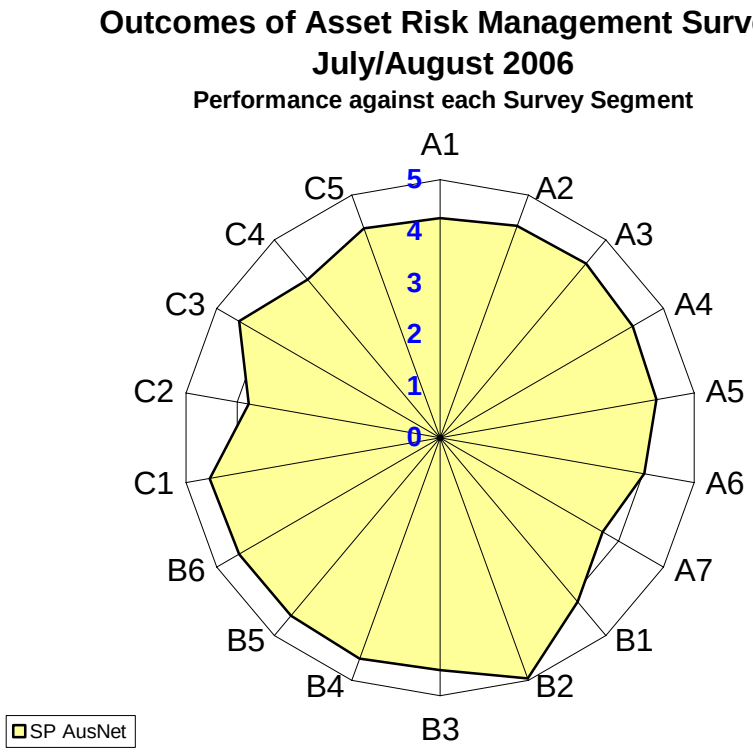


Figure 2: SP AusNet's Performance Radar Plot

The key to the Radar Plots is as follows:

Score	**Classification**
5	Leading
4	Above Intermediate
3	Intermediate
2	Below Intermediate
1	Trailing

	Section B **Asset and Network Strategy**
B1	From Policy to Procurement
B2	Defining Asset Life and Sustainability
B3	Recording Asset Information
B4	Innovation and New Technology
B5	Security of Supply and Asset Utilisation
B6	Compliance with Legislation

	Section A **Business Strategy and Direction**
A1	Aims and Objectives
A2	Identifying Key Issues for Asset Risk Management
A3	Assigning Accountabilities
A4	Structures and Contracts
A5	Operating, Integrating and Interpreting
A6	Risk Assessment and Decision-Making
A7	Review Process

	Section C **Asset Lifecycle Management**
C1	From Procurement to Delivery
C2	Asset Register Contents
C3	Utilisation
C4	Use of Contractors/Suppliers
C5	Inspection and Maintenance Regimes

The general trend of SP AusNet's performance is that its strongest area is Section B, the Asset Network Strategy with the company scoring an average of 4.3. SP AusNet's poorest performance came in Section C Asset Register Contents rated at 3.8 and Risk Assessment and Decision Making at 3.2. The Section A average performance was 3.7.

More specifically SP AusNet's performance against each of the 18 Segments of the survey was as shown below:

	Section A Business Strategy and Direction	Score
A1	Aims and Objectives	4
A2	Identifying Key Issues for Asset Risk Management	4
A3	Assigning Accountabilities	4
A4	Structures and Contracts	4
A5	Operating, Integrating and Interpreting	4
A6	Risk Assessment and Decision-Making	3
A7	Review Process	3

	Section B Asset and Network Strategy	Score
B1	From Policy to Procurement	4
B2	Defining Asset Life and Sustainability	5
B3	Recording Asset Information	4
B4	Innovation and New Technology	4
B5	Security of Supply and Asset Utilisation	5
B6	Compliance with Legislation	4

	Section C Asset Lifecycle Management	Score
C1	From Procurement to Delivery	4
C2	Asset Register Contents	3
C3	Utilisation	4
C4	Use of Contractors/Suppliers	4
C5	Inspection and Maintenance Regimes	4
C6	Risk Assessment and Decision Making	3

It is noted that a number of risk evaluation models and processes were under development at the time of the review but were not considered as they were in the draft stage.

SP AusNet's Strengths

SP AusNet's strengths were shown to be as follows:

- SP AusNet has well-developed processes in the Business Strategy and Planning segment of the Division to identify and assessing the risks for the network in the medium to long term. These are integrated into the Corporate Risk Register.
- Wide experience of Board in infrastructure businesses and involvement with review and comment on Asset Management Strategy, Asset Management Plan and Corporate Risk Plan.
- A strength is the area of assigning accountabilities demonstrated by strong management involvement in the formulating, documenting and devolvement of corporate objectives through the organization to the individual level
- The Asset Management Model, where there is segregation of strategic long-term asset management from the short-term operational delivery provides for reduction in planning and performance conflicts.

- Although network augmentation for security of supply is not a responsibility of SP AusNet, there is a strong in focus on security of supply through monitoring and improvement of asset condition and asset utilisation.
- The use of an annual “workshop approach” and specialist input to the Asset Risk Management process risk identification is sound but outputs need to be formalized.

Improvement Opportunities

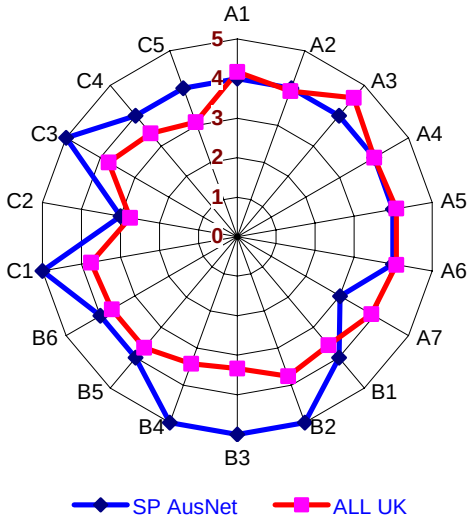
SP AusNet has reasonably developed asset risk management processes. However these are not well documented and generally not supported by Asset Management policies and procedures, except in the maintenance area where detailed documented procedures exist.

- Need to document the transitional plans for non-compliance of technical standards (a NEMMCO requirement)
- The full implementation of the Asset Health Report, the development of which is now nearing completion, will greatly improve critical base information especially with regard to risk performance measurement.
- The implementation of the Corporate Risk Software needs to be completed to improve risk analysis of decisions being made.
- Asset Risk management processes and Asset Models need to “roll out” for all assets to provide consistency of approach to risk assessment and decision-making.
- SP AusNet’s view of the long-term time horizon for setting their asset risk management strategy is generally confined to the next regulatory period and no more than a 10-year period. A longer-term view would seem to more appropriate.
- SP AusNet uses a reasonably defined and effective documented approach to risk management, including some modeling. Since the review was completed in August improvement activities have been ongoing. However more improvement will be achieved by introducing a rigorous, integrated and systematic approach to identifying, assessing and recording risk.
- The better collection and strong and utilization of the asset lifecycle information should be a primary focus for SP AusNet. Currently some valuable information is collected.
- Improve quality control process that monitors the compliance and workmanship of both internal and external contractors.
- Although the deployment of corporately set objects is sound some more well-defined performance objectives (e.g. asset performance, monitoring, and risk identifying and recording), set and monitored at Divisional and the individual levels would be a benefit.
- Monitoring of performance against the medium and longer-term objectives needs improvement. Currently some monitoring of contractor output is conducted but very little for internal resources.
- More detailed review of resourcing needs and the inclusion of a resourcing section in the Asset Management Strategy.
- The involvement in more meaningful asset management benchmarking, particularly outside the electricity industry would more than likely, lead to improved practices.

Comparison to Ofgem Survey Results

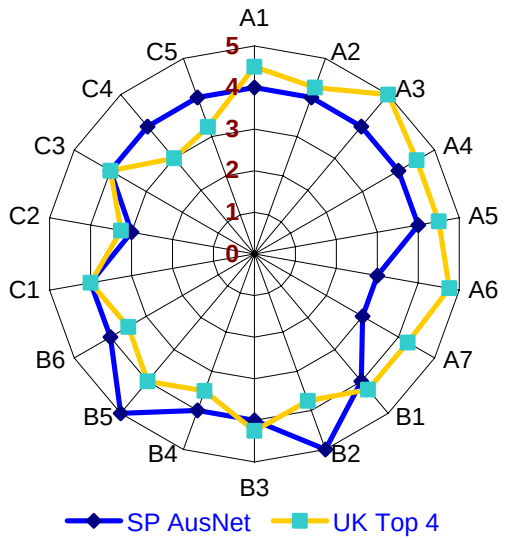
The Spider Graphs below compare SP AusNet's performance with two outcomes of the 2002 Ofgem Study. Graph one compares SP AusNet's performance against the combined performance of all Ofgem participating companies. Graph two compares SP AusNet's outcomes against the top 4 Ofgem Study performers.

Graph One SP AusNet compared with Average of UK Study



The graph shows that SP AusNet performs well against the average of the 12 companies in the Ofgem study. In Section A, Business Strategy and Direction, SP AusNet's performance is generally equal to the average with lower than average performance in Assigning Accountabilities (A3) and Reviewing Process (A7). In Section B, Asset and Network Strategy, SP AusNet outpoints the average in all categories. In Section C, Asset Life Cycle Management, SP AusNet again shows superior performance in all segments.

Graph Two SP AusNet Performance Compared to Average of Top 4 UK Performers



When comparing SP AusNet's performance to the average of the best 4 performers in the Ofgem Study the chart shows areas where SP AusNet will benefit from establishing relationships with these best performers. In Section A, Business Strategy and Direction, SP AusNet's performance is equal to or below the average in all 7 categories. The poorest performing segments are A6, Risk Assessment and Decision Making and A7 Review Process.

In Section B, Asset and Network Strategy, SP AusNet is equal to or better than the UK top 4 company average in all categories. It is superior in performance in Segments B2 Defining Asset Life and Sustainability, B4 Innovation and New Technology, B5 Security of Supply and Asset Utilisation and B6 Compliance with Legislation.

In Section C, Asset Life Cycle Management, SP AusNet again shows a performance equal to or superior in all segments except number 2, Asset Register Contents. SP AusNet scored a 4 on segment C4 Use of Contractors and Suppliers and a 4 on Segment C5 Inspection and Maintenance Regimes, which was, better than the UK Top 4 company average.

Summary

SP AusNet's overall Survey result is good with strong performances in most Sections. The results indicate that SP AusNet's is undertaking its Asset Risk Management activities in a structured and sound manner and is at or better than most best practices identified in the UK Ofgem study.

In several areas SP AusNet is performing exceptionally well while in other segments clear improvement opportunities have been identified. Addressing these improvement opportunities will lift the overall performance even more.

It is suggested that the review exercise be completed again in 18 months time to ascertain how SP AusNet has addressed the improvement actions identified.

Attachments:

Attachment 1	Asset Risk Management Scored Questionnaire
Attachment 2	Asset Risk Management Survey Scoring Matrix
Attachment 3	List of Participants in the Survey
Attachment 4	Ofgem Report

Asset Risk Management Survey
Scoring Matrix

Attachment 1

Score	Process	Evidence	Integration	Deployment	Review	Scoring Guideline
5	Comprehensive documented process for the effective operation of the risk management process step under consideration. The company would be able to demonstrate a well thought out, fully developed and well documented process	There is strong evidence that the process is carried out in an integrated way with the other steps of the process and information flows into and out of the step under consideration	There is clear evidence that inputs to and outputs from the individual risk management process are connected and integrated to the overall organizational risk management process	The process is deployed across all asset types and across the regional and organizational structure	There is evidence of regular reviews that demonstrate the effectiveness of the process in benefiting asset stewardship, evidence and refinement of the overall process as a result of the review process	As a guideline, a company that achieves less that 90% of the scope of the question will achieve a 5 point score
4	The particular step of the risk management process under consideration is mostly documented, in place and fairly well developed for the company actively under assessment and shown to be working effectively in that area	There is evidence that the process is carried out in an integrated way with the other steps in the process and information flows from each step into other steps	The company is unable to demonstrate that the process is fully and effectively integrated into the overall organizational risk management process, although there may be evidence that this is happening in many areas	The process is deployed across most asset types and regional areas but there is insufficient evidence to confirm that outputs from the risk management process applied to the individual asset types are integrated into the overall organization of the risk management process	There is evidence of regular reviews of the effectiveness of the process and evidence of refinement to the overall process as a result of the review process	As a guideline, a company that achieves less that 75% of the scope of the question will achieve a 4 point score
3	The particular step of the risk management process under consideration is moderately well defined and documented but there are a few areas where some improvements could be made or completed	Information into and out of the step of the risk management process under consideration is not fully effective but there is some evidence that it is taking place	The company is unable to demonstrate that the process is fully and effectively integrated into the overall organization risk management process although there may be some evidence that this is happening in some areas	The process is deployment across half of asset types or regional areas but not all	There is evidence of reviews or refinement to the process as a result of the review process but not on a regular basis or in a structured way	As a guideline, a company that achieves less that 50% of the scope of the question will achieve a 3 point score
2	The particular step of the risk management process is loosely defined and documented but with several areas either lacking the definition or specification. A number of areas of the process would require improvements	Limited evidence of information flow into and out of the step of the risk management process under consideration	Limited evidence of the risk management process being integrated into the organizational risk management approach	Deployment across about less than half of asset types/ activities and/or regional areas	Limited evidence of a review process for assessing the effectiveness of the process or refining it	As a guideline, a company that achieves less that 25% of the scope of the question will achieve a 2 point score
1	The particular step of the risk management process under consideration is poorly defined and documented with many areas either not covered or in need of improvement. Some areas may be carried out on an informal basis but this is not fully documented	Little evidence of information flow into and out of the step of the risk management process under consideration	Little evidence of the risk management risk management process being integrated into the organizational risk management approach	Deployment across few if any asset types/activities and/or regional areas	Limited or no evidence of a review process for assessing the effectiveness of the process or refining it	As a guideline, a company that achieves less that 10% of the scope of the question will achieve a 1 point score

Ofgem document reference: 30/02

Asset Risk Management Survey

Survey Guide

(including Survey Questionnaire)

A report for Ofgem by:

BPI BRITISH POWER INTERNATIONAL

ERA TECHNOLOGY

Mott MacDonald

List of Contents

Tables

Figures

Glossary

ARM	Asset Risk Management
IIP	Information and Incentives Project
Long term	a period in excess of five years ahead
Medium term	a period of time up to five years ahead
RM	risk management

Summary

Ofgem is seeking to promote greater visibility of asset risk management in the transmission and distribution of electricity and gas. The key aims of this initiative are to allow Ofgem to gain reassurance of the quality of the approaches being adopted by the network companies to the risk management aspects of their stewardship of the asset base, and the identification and encouragement of best practice in the area of asset risk management.

To fulfil the aims of this initiative Ofgem has initiated an Asset Risk Management Survey. The survey has been prepared on behalf of Ofgem by British Power International, ERA Technology and Mott MacDonald. They have been retained by Ofgem to assist in the first year of the survey's development and implementation.

This document details the work done thus far in the production of a survey guide and questionnaire designed to enable Ofgem to gather information on attitudes and approaches to asset risk management from the licensed gas and electricity transmission and distribution businesses throughout England, Scotland and Wales.

To explore the management of asset risks a simplified model of the typical risk management process has been adopted as the basis of the survey questionnaire and scoring methodology. A series of questions covering the main categories first proposed in Ofgem's first consultation document in November 2001 have been formulated. Each main category is split into a number of key topics against which a main question and a basket of sub-questions is asked. The responses from the companies across the whole questionnaire will be assessed against the risk management model and will explore the level of development, extent of deployment and level of integration of risk management processes across the range of asset management activities. As part of the questionnaire within one of the categories questions have been targeted to probe selected operational areas to assess the application of the risk management process and explore its effectiveness across certain aspects of the asset base and network.

The company responses to the questionnaire will initially be assessed based on a scoring methodology. Following this initial scoring each company will be subject to an audit visit to seek evidence to confirm the responses provided in the questionnaire. Upon completion of this process a final score can be awarded for each key topic area. The scores will then be used to provide a classification from 'leading' to 'trailing' for that area of the questionnaire, thus enabling the identification of asset risk management performance within the industry.

The results of the survey will be published in the form of a commentary and a series of 'radar plots' which will show relative company performances in each of the key topic areas.

Full company results will be confidential to Ofgem and the company, with an industry summary produced for public reporting. In the first year, the participating companies will be named in the published report, but their individual scores or commentaries will not be identifiable.

This is the first year of the survey and Ofgem acknowledges that there will be refinements made for future survey years.

1 Introduction

Ofgem's primary obligation is to protect the interests of both existing and future consumers of electricity and gas. The responsible stewardship of long-life network assets by companies is a key factor that impacts on the interests of existing and future consumers and as a consequence it is an area in which Ofgem takes an interest. Asset risk management is an important part of the process of ensuring longer term network performance, therefore Ofgem is seeking to promote greater visibility of asset risk management in order to encourage best practice and to gain reassurance of the management of network infrastructure.

Ofgem first proposed the concept of an annual Asset Risk Management (ARM) Survey in a consultation document published in November 2001[1]. Comments on the proposal were invited from the electricity and gas transmission and distribution companies (network companies) and other interested parties.

The Regulator has appointed a consortium of consultants to assist in the preparation of the survey. The consortium is made up of British Power International, ERA Technology and Mott MacDonald, who are also currently working with Ofgem on the Information and Incentives Project (IIP). The companies have brought together people who have industry-based technical expertise, a strong audit background and the analytical skills needed to help deliver the requirements of this survey.

This paper presents the survey that has been designed to explore the asset risk management approaches of the electricity and gas network companies taking into account all stakeholder requirements. It will enable Ofgem to highlight risk management approaches that are considered to be 'best practice' within the context of risk management of network assets. This work will complement, but be separate from, other initiatives such as Ofgem's IIP work.

The proposed survey document is set out in this paper in the following manner:

- Section 2 describes the structure of the questionnaire. This section includes the key areas of analysis and the asset risk management model adopted as the basis of the survey. In addition this section includes the general and detailed structure of the questions explaining how the current questionnaire has evolved from the initial proposals of the first consultation document, how the format of the questionnaire will be set out and provides a guide to the different level of questioning of the survey

- Section 3 gives a detailed explanation of the proposed scoring methodology developed to score the companies' responses to the questionnaire

- Section 4 sets out the proposed survey process including the distribution of the questionnaire, the audit visits and the production of company reports

- Appendix A contains the proposed survey questionnaire

[1] Asset Risk Management in electricity and gas networks – A proposed survey and its interaction with Information and Incentives Project, First consultation document. November 2001

2 Structure of the Proposed Survey

2.1 Introduction

This section covers how the proposed survey has been developed and formulated.

2.2 Key Areas of Analysis

Due to the high level of the survey and the acknowledgement that there is significant commonality between the management of asset risk within both the gas and electricity network companies the proposed survey is designed to be generic and applicable across all sectors within the industry.

Asset management is a term that has been widely used in recent years and has developed many different meanings, ranging from purely financial management through to the very narrow definition of routine asset maintenance. This survey will review the approach to the management of risk to the whole life management of the infrastructure assets, both for delivering longer-term performance to required standards and for ongoing infrastructure development for future users.

To understand the main issues that concern asset risk management a review of the policies, strategies and systems in place to manage the network and its assets is necessary. Additionally, information exchange throughout the organisation is an important part of the process.

The following categories first proposed in Ofgem's consultation document of November 2001 have been viewed as broadly reflecting the key areas within a company where risk asset management activities take place and so provide a useful framework for developing this generic survey:

Category A Business Strategy and Direction

Category B Asset and Network Strategy

Category C Asset Life Cycle Management

These categories are employed to classify a set of general questions (see Appendix A) that will be presented to the companies to explore their asset risk management strategies. Within Category C, selected topics have been included to probe specific operational areas. The selected topics will be reviewed in future survey years.

2.3 Asset Risk Management Model

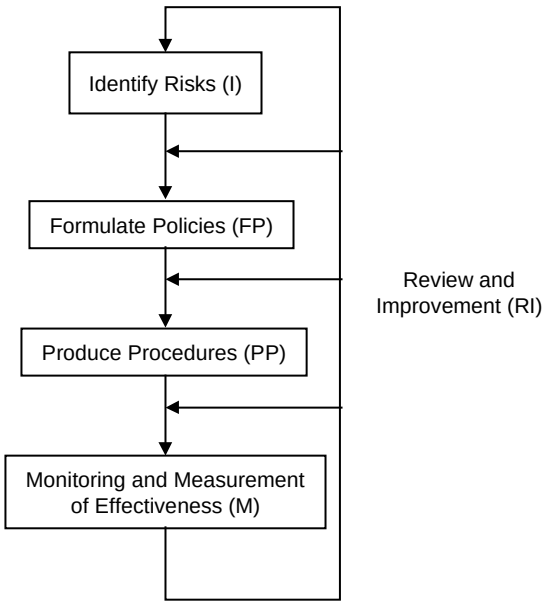
A simplified risk management model has been developed (see Figure 1) based on a number of theoretical models, which shows the high-level steps in a typical risk management process.

It is appreciated that other models exist, such as those contained in HSE guidelines and various quality management processes such as ISO 9000 and ISO 14000. It is however considered that the simple high-level model in Figure 1 embodies the theories underlying these other models and, combined with the content of the proposed questionnaire, is sufficiently robust to allow the exploration of the asset

risk management process at the level required for this survey. The proposed model splits the process into the following critical elements:

1. Identify Risks (I)
2. Formulate Policies (FP)
3. Produce Procedures (PP)
4. Monitor and Measure Effectiveness (M)
5. Review and Improvement (RI)

Figure 1: Risk Management Model

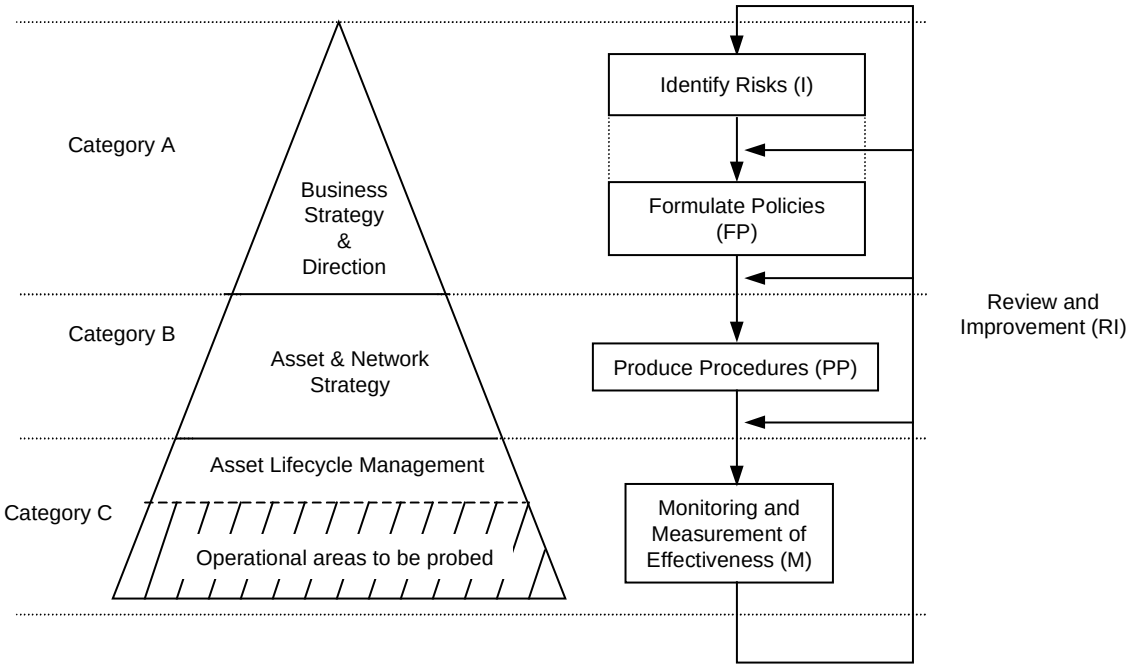


The importance of review and improvement within the risk management process is reflected in the fact that this activity feeds into the process at each step.

The questions in the survey have been structured to investigate this risk management model for the key areas of analysis identified in Section 2.2. For the reasons outlined above it is considered that the area of Review and Improvement will be included in the question sections for each of the other process steps. As an integral part of each step the questions have been structured to include the assessment of how information is fed into the step and how it flows out of the step.

Figure 2 shows how the risk management model maps to the key activity categories identified by Ofgem in their November consultation document.

Figure 2: Mapping of Risk Management model to Asset Risk Management Activity Categories



The figure above shows how we consider that the risk management model could be applied across the different activity categories within the surveyed companies. This is designed to account for the application of risk management as an integral part of a top-down management process.

The proposed questionnaire will assess the asset risk management process across all the three main categories, in each case targeting the questions to explore the principal steps in the typical risk management model carried out at that level as shown in Figure 2.

As well as the general questions for Categories A, B and C, which investigate the risk management model steps, it is also proposed that more specific questions will be included to assess the application and effectiveness of the asset risk management process. This section of the questionnaire is expected to change on an annual basis to explore the effectiveness of the process in different areas.

For the 2002 survey the areas selected will be:

(a) asset registers;

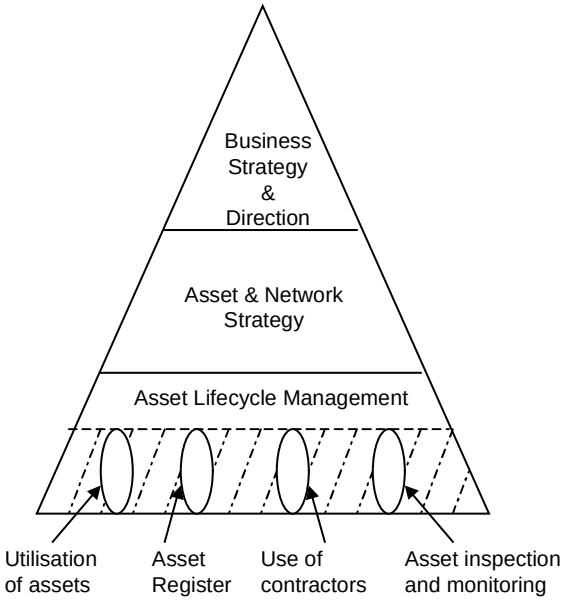
(b) utilisation of assets;

(c) use of contractors/suppliers;

(d) asset inspection and monitoring regimes.

and as illustrated in Figure 3 below.

Figure 3 : Operational Areas to be Investigated



The areas selected for the detailed section of the survey are likely to develop or change in future years. The gathering of performance evidence in these selected areas will also enable base-lining of performance that can be reviewed as an on-going measure of the effectiveness of the asset risk management process.

This approach will allow the assessment of how the risk management process feeds through from the corporate level, through the asset strategy level to effective 'on-the-ground' application of the risk management process. By carrying out this type of probing questioning we will test the effectiveness of this process.

2.4 Questions

2.4.1 General Structure

The proposed structure of the survey questionnaire reflects the basic model (Figure 1) of how asset risk management may fit into the companies' structure and activities. Whilst this model is not expected to exactly reflect individual organisational structures, it does help to define the key topic areas that the survey will address.

Questions have been formulated to fit within the three main categories identified in section 2.2. Beneath these main categories a series of sub-category question areas has been developed to reflect the areas to be investigated during the proposed questionnaire process. These sub-categories have been titled key topic areas. Shown below are the key topic areas to be covered:

(I) Business Strategy and Direction

- Aims and objectives
- Identifying key issues for Asset Risk Management

- Assigning accountabilities
- Structure and contracts
- Operating, integrating and interpreting
- Risk assessment and decision making
- Audit and accreditation

(II) Asset and Network Strategy

- From policy to procedure
- Recording asset information
- Defining asset life and serviceability
- Innovation and new technologies
- Security of supply and asset utilisation
- Compliance with legislation

(III) Asset Lifecycle Management

- From procedure to delivery
- Asset register contents
- Utilisation
- Use of contractors and suppliers
- Inspection and maintenance regimes

Although questions are structured into these three categories, the survey recognises that the most effective overall approach to asset risk management is to take an integrated and balanced view of the issues, from corporate strategy through to network strategy and life cycle asset management.

The proposed survey questions have been structured to test for integration of information flows between the three categories. It will also check how effectively processes are being applied and how companies are monitoring and reviewing their effectiveness in order to continuously improve asset risk management techniques. As review and improvement is implicit at each stage of the risk management process, included at each step are questions that will probe this aspect.

2.4.2 Format of the Questions

(i) Introduction

This section explains the structure of the proposed questionnaire and shows how the structure has been designed to explore the relevant areas. The full questionnaire is shown in Appendix A.

Respondents should familiarise themselves with all the questions before starting to answer them. It is suggested that a thorough reading of the whole questionnaire will assist respondents in understanding what information is being sought and where best to include the relevant information and evidence.

Companies should ensure that statements of performance can be backed up with evidence if requested at the survey visit.

Table 1 shows an example question from the questionnaire to illustrate the format.

(ii) Categories

The questionnaire is divided into three sections. These correspond to the categories established in the model of asset risk management activities in Ofgem's first consultation document in November 2001.

- Business Strategy & Direction (Category A)
- Asset & Network Strategy (Category B)
- Asset Lifecycle Management (Category C)

Within each of the three main categories key topic areas have been identified and a series of questions both high level and more detailed have been asked.

(iii) Topic Area Main Narrative Question

The main numbered questions, which head the beginning of each sub-category, (shown in bold print), and marked as ***Topic Area – narrative question*** act as key topic areas. A key topic heading is also shown. At this level of the questionnaire a company should 'set the scene' for the topic area, providing a brief narrative that describes its general process and approach to that topic. It is also an opportunity for the company to include information which may not be specifically asked in the more detailed sub-questions but is felt to be of importance in demonstrating the company's approach in that area. The response to each of these questions should be restricted to no more than 250 words.

(iv) Sub-Question

In the second column of the questionnaire, and associated with each main question, is a basket of ***Sub-questions*** (a, b, c etc.) and these should each be answered briefly and factually. If the respondent considers that it is imperative for the assessment of the question that further information is provided the responses to the sub-question may be up to 200 words but no longer. These questions are the main route by which the survey seeks to obtain evidence for the general risk management approach and identify the level of information needed to establish best practice, and that asset stewardship is being adequately carried out. The individual sub-questions themselves will not be scored, but will be used to obtain more specific evidence in support of the narrative response to the main question.

(v) Areas for Consideration

Supporting the sub-questions is a series of bullet points. They provide a guideline of areas that the companies are encouraged to cover in their answers to the sub-questions. The points are indicative and by no means exhaustive and should be considered in this light.

(vi) Scoring Areas

A risk management step identifier (Scoring Area) is assigned to each of the ***sub-questions*** as shown in the third column of the example question shown in Table 1. These identifiers correspond to the steps of the risk management model shown in Figure 1. Figure 2 illustrated how the risk management model mapped on to the key activity categories. This showed that for category A, questions would either be classified as 'identify risks' or 'formulate policies', while for categories B and C the questions would explore 'produce procedures' and 'monitoring and measurement of effectiveness' respectively. This allows the assessment of a company's performance for each of the steps (the scoring is explained in detail in Section 3).

(vii) Summary

It is important that sub-questions are considered carefully and a clear and full response provided taking into account the areas of consideration guidelines shown against each sub-question or group of sub-questions. Respondents should review the scoring definitions in Section 3, which outline how the response is assessed and scored in order to understand what level of evidence is required to achieve each score.

Evidence should be available to support all statements and claims made in the responses.

The way the questions are structured is demonstrated in the following example.

Table 1: Example Question

Category:	Business Strategy and Direction
Topic Area:	Risk assessment and decision making

Topic Area – Narrative Question.

Risk Assessment and Decision Making

What is the process for making Asset Risk Management decisions?

Ref.	Sub-Question	Scoring Area	Areas of Consideration
a)	Does the company carry out risk analysis studies of the decisions made?	I	• Scope, depth and comprehensiveness of risk analysis studies • Risks identified • Acceptable levels of risk • Integrated approach to risk, or separate • Breadth of application, e.g. assets, skills and resources, logistics.
b)	What specific policies has the company formulated to manage the risks identified?	FP	• Mitigation of the effects of risks that have been identified as unacceptably high • Monitoring the effect of risk mitigation actions.

Ref.	Sub-Question	Scoring Area	Areas of Consideration
c)	Does the company use a formalised methodology for decision support?	FP	• Methodology • Quantified risk information used in action planning • Consistency of approach • Communication to decision makers • Review of methodology • Effectiveness.
d)	Has an overall Risk Analysis been carried out for the performance of the network?	I	• Company wide network performance Risk Analysis study • Performance as seen by customers (e.g. reliability, availability, quality) • Approval/review by senior management • Future changes • On-going/repeatable • List other risk assessment areas that have been considered.

3 Scoring

3.1 Introduction

Ofgem considers that in order to interpret the responses to the survey effectively, it is necessary to develop a methodology for scoring the company responses to the questionnaire.

This section therefore introduces the scoring methodology developed to score the responses to the survey questionnaire. A discussion of the options considered, the way in which the scoring will be applied and what constitutes each score level are included.

The scoring methodology proposed in the first consultation document has been modified and expanded to utilise the risk management process model adopted (Figure 1) as the basis for this survey.

The methodology has also been developed to accommodate some of the concerns raised by the network companies in responses to the first consultation document.

3.2 Options for Scoring Methodology

The scoring methodology and questionnaire are intrinsically linked. They therefore have to be developed concurrently and take each element into account.

3.2.1 Option 1

Option 1 would be to devise a questionnaire that relies on closed questions to which mainly "yes" or "no" answers would be required. The response could then be marked against a pre-determined answer, resulting in a percentage of "correct" answers, which could then be ranked/graded against a defined percentage score. There would be a need to weight the scores to get an overall grade. During the audit visits the auditor would collect data/evidence against a pre-determined checklist.

Advantages

- Simple and transparent method of conducting the survey
- Ensures absolute consistency across the surveyed companies

Disadvantages

- Does not take account of different and equally valid approaches that may be carried out in different companies
- Does not allow the survey to explore the details of the asset risk management approach without resulting in very large volumes of questions
- Does not allow companies to provide details of innovative and different approaches that may not have been considered by the originators of the survey
- Weighting the scores across such a wide range of questions would be complex.
- Risk of Ofgem appearing to prescribe a specific approach, rather than using it as a tool to identify best practices.

3.2.2 Option 2

Option 2 would be to structure the questionnaire around the categories initially proposed in Ofgem's first consultation document, but using a tiered approach of more open questions to explore the asset risk management approach in more detail. The scoring would be structured on the basis of the provision of evidence to demonstrate that the company had an effective and thorough approach to risk management throughout the company structure. The range of possible scores to be awarded would depend upon the degree to which the levels of performance are to be sub-divided. The scores could then be aggregated if required to give a score for a particular area or an individual aspect of the risk management process.

Advantages

- Allows the survey to be sufficiently generic to cover different asset risk management approaches across different companies
- The survey can probe below the superficial responses to seek evidence to support company statements
- In scoring the survey, account can be taken of a number of important areas necessary for the successful operation of the process within one score

Disadvantages

- The questionnaire responses and audit visits will need to cover significant amounts of information
- There will be a degree of subjectivity in determining how well the questionnaire responses satisfy the requirements for a particular score

3.2.3 Conclusion

Having considered the options above and possible variations within these options, it was considered that Option 2 represented the most appropriate survey structure and scoring approach in order to achieve the aims set out for the survey. The success of this option will be assessed following completion of the first survey to establish where refinements may be required.

3.3 Application of Scoring

To score the survey questionnaire it is proposed to use the risk management process model shown in Figure 1 will be used as the basis.

As described in Section 2.4.2 the question areas are broken down into key topic area main questions, sub-questions with areas for consideration guidelines. The questions have been designed to explore the particular step of the risk management process model carried out at the company level targeted by that set of questions.

Each main question has a number of sub-questions associated with it. For each sub-question a scoring identifier/risk management process step has been attributed. A score between 1 and 5 will be awarded to the main question based on the narrative response to that question and the responses to the sub-questions. For the main questions in categories B and C all sub-questions will be to explore the same principal step with the review and improvement step included in all main questions, while in category

A two steps of the risk management model as well as the review and improvement step will be covered.

Category A (Business Strategy and Direction) - Identify risks

- Formulate policies

Category B (Asset and Network Strategy) - Produce procedures

Category C (Asset Lifecycle Management) - Monitoring and measurement of effectiveness

The scores will be awarded based on how the responses demonstrate that the process step under question is being carried out and provides evidence that could be compared against the scoring definitions shown in Section 3.5.

An initial score for the main question will be awarded based on the responses to the questionnaire. In areas where the response is insufficient this score will then be confirmed by seeking further information during the auditor's visit.

For Category C, in addition to the responses to the questions being awarded a numerical score, the questions also request certain key metrics as verification of performance.

3.4 Scoring Criteria

To score the key topic areas for Categories A, B and C, the quality of evidence provided in the response to the main question and the sub-questions will be assessed. The scope of the response is expected to cover the following points,

- The degree of development of the risk management process step and its application across company activities/assets.
- The extent of information flow into and out of the risk management process step
- The extent of integration and effectiveness of the process within the overall organisational asset risk management approach
- The extent of application of the process across all asset types and regional areas
- The review of the step and its use in refinement and improvement of the process
- The extent to which asset stewardship is benefiting in practice

These points form the framework for the scoring definitions shown below in section 3.5.

From the response to the main question and sub-questions, the auditor will form an understanding of the company's asset risk management approach for that key topic area. During the audit visit the auditor will verify the extent of, or absence of, the evidence available to support the responses, particularly where responses to the questionnaire were considered insufficient.

The respondents should familiarise themselves with the scoring definitions and criteria for scoring in section 3.5 in order to understand how the evidence presented in the responses will tie in with the scoring process.

The scoring methodology is intended to take account of the variability in the extent and robustness of the evidence available. Therefore, the auditor will be able to grade the response and evidence over a range of scores.

3.5 Scoring Definition

The main questions will be awarded a score from 1 to 5.

The score will depend upon the response to the main question and sub-questions, although the individual sub-questions will not be scored separately. The scores will be based on the extent of the risk management process step for the company activity under assessment, the flow of information into and out of each process step, the degree to which the process is dynamic with review and improvement an integral part, and the evidence of a positive benefit for asset stewardship

3.5.1 Criteria for award of 5 points

- Comprehensively documented process for the effective operation of the risk management process step under consideration. The company would be able to demonstrate a well thought out, fully developed and well documented process
- There is strong evidence that the process is carried out in an integrated way with the other steps of the process and information flows into and out of the step under review
- There is clear evidence that inputs to and outputs from the individual risk management processes are connected and integrated to the overall organisational risk management process
- The process is deployed across all asset types and across the regional and organisational structure
- There is evidence of regular reviews that demonstrate the effectiveness of the process in benefiting asset stewardship, and evidence of refinement of the overall process as a result of the review process
- As a guideline, the company will need to achieve greater than 90% of the scope of the question to achieve a 5-point score.

3.5.2 Criteria for award of 4 points

- The particular step of the risk management process under consideration is mostly documented, in place and fairly well developed for the company activity under assessment and shown to be working effectively in that area
- There is evidence that the process is carried out in an integrated way with the other steps of the process and information flows from each step into the other steps
- The company is unable to demonstrate that the process is fully and effectively integrated into the overall organisational risk management process, although there may be evidence that this is happening in many areas

- The process is deployed across most asset types and regional areas but there is insufficient evidence to confirm that outputs from the risk management processes applied to the individual asset types are integrated into the overall organisational risk management process
- There is evidence of regular reviews of the effectiveness of the process and evidence of refinement to the overall process as a result of the review process
- As a guideline, the company will need to achieve about 75% of the scope of the question to achieve a 4-point score.

3.5.3 Criteria for award of 3 points

- The particular step of the risk management process under consideration is moderately well defined and documented but there are a few areas of the process where some improvements could be made or completed
- Information flow into and out of the step of the risk management process under consideration is not fully effective but there is some evidence it is taking place
- The company is unable to demonstrate that the process is fully and effectively integrated into the overall organisational risk management process although there may be some evidence that this is happening in some areas
- The process is deployed across around half of asset types or regional areas but not all
- There is evidence of reviews or refinement to the process as a result of the review process but not on a regular basis or in a structured way
- As a guideline, the company will need to achieve about 50% of the scope of the question to achieve a 3-point score.

3.5.4 Criteria for award of 2 points

- The particular step of the risk management process under consideration is loosely defined and documented but with several areas either lacking in definition or specification. A number of areas of the process would require improvements
- Limited evidence of information flow into and out of the step of the risk management process under consideration
- Limited evidence of the risk management process being integrated into the organisational risk management approach
- Deployed across about less than half of asset types/activities and/or regional areas
- Limited evidence of a review process for assessing the effectiveness of the process or refining it
- As a guideline, the company will need to achieve about 25% of the scope of the question to achieve a 2-point score.

3.5.5 Criteria for award of 1 point

- The particular step of the risk management process under consideration is poorly defined and documented with many areas either not covered or in need of improvement. Some areas may be carried out on an informal basis but this is not fully documented.

- Little evidence of information flow into and out of the step of the risk management process under consideration
- Little evidence of the risk management process being integrated into the organisational risk management approach
- Deployed across a few if any asset types/activities and/or regional areas
- Limited or no evidence of a review process for assessing the effectiveness of the process or refining it
- As a guideline, a company that achieves less than 10% of the scope of the question will achieve a 1-point score.

3.5.6 Summary

The final score awarded will depend on both the extent and level of development of the risk management process and the range of application of the process across the asset types and across the organisation. For example, a company may have a well-developed policy in an aspect of risk management, but which is effectively applied to only about half of its network assets. Therefore, although the process has been well developed, it can not be demonstrated that it is integrated across the company. Under these circumstances a company would score 3 points.

The scoring can be summarised as follows;

Table 2: Scoring Summary

Process Development	***Guideline for extent of application***	***Points Awarded***
Process fully integrated and effective across the whole company, bringing clear benefits for asset stewardship	>90%	5 points
Process mostly in place but not shown to be integrated and effective across the whole company	75%	4 points
Process development complete to moderate extent and/or not applied to notable areas of company asset activities or regions	50%	3 points
Process under development and/or applied to only some areas of company asset activities or regions	25%	2 points
Little or no evidence of process and/or limited application across company asset activities or regions	<10%	1 point

3.6 Key Topic Area Scores

The score awarded to the main question as described above will give a numerical value between 1 and 5 to demonstrate how well the step of the risk management process for which that question was devised is carried out.

This will result in, for example, seven scores for the main questions asked for category A, covering identification of risks and formulation of policies (and review and improvement). These scores can either be presented on a radar plot as discussed in Section 4 to show the overall company approach to

these areas of asset risk management and a commentary made to identify areas of best practice, even where these may not be fully integrated enough to achieve the 5-point rating.

The scoring methodology has been intentionally designed to avoid the need for weighting of scores and the potential this would allow for the aggregation of scores/classifications for the different risk management steps into an overall score for the company.

3.7 Key Topic Area Classification

To illustrate the level of development and practice of the asset risk management steps across the company activities, we propose to "grade" the approach in the areas assessed.

Table 3: Classification Scores

Classification	Points
Leading	5
Above Intermediate	4
Intermediate	3
Below Intermediate	2
Trailing	1

A Company with a leading classification for certain steps of its asset risk management process could be identified as one with elements of best practice. This issue is discussed further in section 3.9.

The scoring system proposed is an 'absolute' score, though this will be moderated by the fact that the survey is being carried out across a number of companies and sectors.

Individual company results will be confidential between the relevant company and Ofgem. There will be an opportunity for each company to discuss its results with Ofgem in order to make best use of the results of the survey.

3.8 Validation of Scoring

3.8.1 Introduction

An issue of concern raised by various companies in their response to the first consultation document concerned the consistency of a scoring methodology and classification across all the surveyed companies given that the survey assessment and audit visits are expected to be carried out a number audit team. This issue will be addressed in a number of ways:

- Independent audit teams containing an appropriate mix of sector knowledge and audit competency
- Moderation of scores
- Single person review of all audit reports to check for consistency of approach and question the assumptions and statements made by the audit team.

3.8.2 Audit Teams

The teams that carry out the audit will contain an appropriate mix of sector knowledge and audit competency. In addition, the auditors will have a parallel survey manual that gives them an objective means by which to seek evidence and assess performance. To avoid the potential for 'reverse-engineering' of results, this more detailed information will not be presented to the companies in the questionnaire.

3.8.3 Moderation of Scores

To ensure that each survey team is adopting a consistent application of the scoring methodology one survey questionnaire will be scored by all teams as an example. The scores generated by each team will be reviewed to check for consistency. Where differences between teams are highlighted guidelines to the relevant audit teams will be issued to ensure that questionnaire assessments will be carried out consistently.

3.8.4 Review of Audit Reports

As a final review a senior person from the audit teams will carry out an overall review of the final audit reports to check the consistency of approach across the survey and question the assumptions and statements made by the audit team.

3.8.5 Conclusion

The detailed format of the validation process is to be finalised prior to carrying out the survey. It should be noted that Ofgem will undertake a formal review with the survey consultant consortium to provide assurance of the consistency of application of scoring and audit.

3.9 Identification of Best Practice

One of the objectives of the survey is to identify companies who have adopted an approach to risk management that would be considered to be a "leading" example in the particular area assessed. This is not intended to represent an endorsement of a particular asset management strategy or risk management strategy, as it is acknowledged that under different circumstances, alternative strategies may be equally appropriate.

We consider that a leading company would be seen as one that fulfilled all elements of the process of risk management and with its risk management process fully effective and integrated within the overall organisational risk management process.

4 Presentation of Results

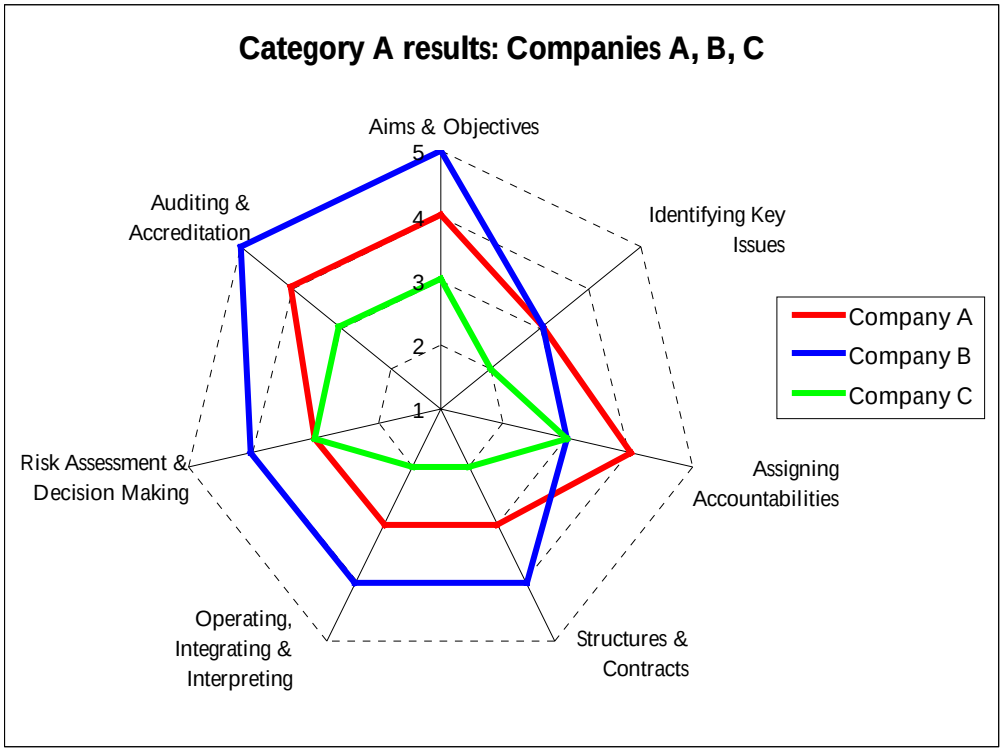
In the first year, results will be made publicly available without identifying the performance of individual companies. The report will identify which companies have participated in the survey, but will not give further company specific information. The detailed results for a particular company will only be available to Ofgem and that company.

The public reporting of results will be in the format of an overview commentary of the companies' surveyed and particular issues of note. This report will also include a series of diagrams to show the high-level performance ratings of companies (without naming them).

Diagrams provide a simple representation of overall performance in a particular area of the survey. The most appropriate format for expressing this information is in the form of a series of 'radar plots', an example of which is shown below.

It is recognised that simple radar plots may not adequately represent all areas of company performance in the survey. For example, a medium ranking score in a particular category may be due to particularly good asset risk management policy or process being in place only for a limited range of the assets. We would still wish to recognise the value of the particular policy or process, and encourage its extension, such that a higher-ranking performance might be achieved in the future. Providing a commentary on examples such as this will be an important supplement to the diagrammatic reporting.

Figure 4 : Example radar plot reporting of results – Survey Category A



A series of these radar plots, each expected to show three or four companies, would cover all the companies surveyed, and to cover each category of the survey.

5 Survey Process Issues

5.1 Introduction

This section provides a guide to how the proposed survey would be conducted. It deals with the distribution of the questionnaire and survey guide; the audit visits to the companies after initial analysis of the responses to the questionnaire and briefly describes the report on the survey results.

5.2 Questionnaires

Each company will receive a copy of the survey guide and questionnaire for completion and return. It is intended that this documentation will be provided in electronic format for ease of use. The aim of the written response questionnaire is to capture in the most concise but effective way, the nature of asset risk management processes in each of the three separate categories. Responses to the questions should be clear and concise, containing all relevant information. The return of responses should be by electronic submission.

The questionnaire will be scored using the scoring methodology developed and an initial score awarded.

The first year of the survey is, in part, a pilot exercise. This will enable the companies to test the format of the written responses against the information and evidence required to assess them.

5.3 Audit visits

The response to the questionnaire is the first stage of the survey process. To ensure that the assessment of the companies' written responses is as rigorous as possible, follow-up visits will be needed to further probe some issues where insufficient or inconsistent information was provided at the questionnaire response stage and to confirm the information provided for the detailed questions in Category C that look in more detail at the effective application of selected asset risk management activities.

To allow companies adequate time to prepare for the audit and to make best use of the limited audit time available, companies will be notified of the areas to be covered during the audit visit and the principal documentation required for review. Some flexibility will be required, however, to recognise that particular questions may arise during the course of the visit.

Where appropriate, the information gathered during these visits will be used to modify the initial assessments/scores, resulting in a final assessment for each company across the range of areas explored.

5.4 Report

Once the visits have been undertaken, the scores revised where necessary, and a review process carried out, a final report with company specific appendices will be prepared for Ofgem. Brief, confidential company-specific appendices, summarising the performance of each company, will

accompany a more general overview report to be presented to Ofgem. The appendices will be treated as strictly confidential and will only be discussed between Ofgem and the respective company. A summary overview of the surveyed companies will also be prepared for publication. In this summary companies participating in the survey will be named but there will be no attribution of scores or individual comments to identified companies.

5.5 Conclusion

It is expected that the first year of this survey will provide valuable information in understanding how the companies carry out the process of asset risk management. It is also likely to highlight areas of the survey where further development will enhance the value of the survey for future years.

As a consequence, in the light of the experience gained during this pilot stage, the opportunity will be taken to carry out any necessary modifications to the format of the questionnaire and scoring methodology in order that this survey will be provide maximum benefit for Ofgem and the network companies in subsequent years.

Appendix A Survey Questionnaire

Appendix A of the Survey Guide
(Ofgem document reference 30/02)

Ofgem Asset Risk Management Survey Questionnaire

Consultation Version

1 Introduction to Questionnaire

In order to facilitate ease of company responses, this Appendix has been designed to be a stand-alone questionnaire within the body of the complete Survey Manual. Thus this introductory section repeats Section 2.4.2 of the Survey Guide. The structure of the questionnaire is explained and the different question tiers used to explore the relevant areas are shown.

Respondents should familiarise themselves with all the questions before starting to answer them. It is suggested that a thorough reading of the whole questionnaire will assist respondents to understand what information is being sought and where best to include relevant information and evidence as compared against the scoring definitions.

Companies should ensure that statements of performance can be backed up with evidence if requested at the survey visit.

2 Categories

The questionnaire is divided into three sections. These correspond to the categories established in the model of asset risk management activities in Ofgem's first consultation document in November 2001.

- Business Strategy & Direction (Category A)
- Asset & Network Strategy (Category B)
- Asset Lifecycle Management (Category C)

Within each of the three main categories key topic areas have been identified and a series of questions both high level and more detailed have been asked.

3 Topic Area Main Narrative Question

The main numbered questions, which head the beginning of each sub-category, (shown in bold print), and marked as ***Topic Area – narrative question*** act as key topic areas. A key topic heading is also shown. At this level of the questionnaire a company should 'set the scene' for the topic area, providing a brief narrative that describes its general process and approach to that topic. It is also an opportunity for the company to include information which may not be specifically asked in the more detailed sub-questions but is felt to be of importance in demonstrating the company's approach in that area. The response to each of these questions should be restricted to no more than 250 words.

4 Sub-Question

In the second column of the questionnaire, and associated with each main question, is a basket of ***Sub-questions*** (a, b, c etc.) and these should each be answered briefly and factually. If the respondent considers that it is imperative for the assessment of the question that further information is provided the responses to the sub-question may be up to 200 words but no longer. These questions are the main route by which the survey seeks to obtain evidence for the general risk management approach and identify the level of information needed to establish best practice, and that asset stewardship is being adequately carried out. The individual sub-questions themselves will not be scored, but will be used to obtain more specific evidence in support of the narrative response to the main question.

5 Areas for Consideration

Supporting the sub-questions are a series of bullet points. They provide a guideline of areas that the companies are encouraged to cover in the answers to the sub-questions. The points are indicative and by no means exhaustive and should be considered in this light.

6 Scoring Areas

A risk management step identifier (Scoring Area) is assigned to each of the ***sub-questions*** as shown in the third column of the questionnaire. These identifiers correspond to the steps of the risk management model shown in Figure 1 of the Survey Guide, Section 2.3. This allows the assessment of a company's performance for each of the steps (the scoring is explained in detail in Section 3 of the Survey Guide).

7 Index

At the beginning of the questionnaire an index provides a guide to the main questions of each category. This index can be used as a method of navigating through the questionnaire.

8 Summary

It is important that sub-questions are considered carefully and a clear and full response provided taking into account the areas for consideration guidelines shown against each sub-question or group of sub-questions. Respondents should review the scoring definitions in Section 4 of the Survey Guide, which outline how the response is assessed and scored. Evidence should be available to support all statements and claims made in the responses.

Index of Questions

Section A Business Strategy & Direction

Q1	*Topic Area –- Narrative Question* **Aims and Objectives** **How does your company's aims and objectives influence the management of assets?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	How are medium/long term network performance issues represented and considered at corporate level?	I	• Performance targets set for the company • Written company objectives • Individual(s) performance targets at each level of management. • Medium/long term network performance targets • Regular items on agendas/ regular meetings
b)	How are variances between progress and targets addressed at this level, and conflicts with other business drivers addressed?	I & RI	• Evidence that medium/long term performance targets have been set • If conflicting, how are short-term pressures relieved e.g. - New connections requirements versus ongoing maintenance/inspection programme • Variances in actual and target performance identified and addressed • Objectives reconciled with other company drivers .

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
c)	What is the extent of Board level experience in relevant asset management areas?	I	• Input to and influence on corporate strategy • Responsibility for medium/long term network performance • First hand experience (in addition to the responsible line manager) • Is this held by executive or non-executive members? • How are asset strategies and proposals tested, challenged and verified?

Q2	*Topic Area –- Narrative Question* **Identifying Key Issues for Asset Risk Management** **Describe the key strategic elements that are critical to setting your overall Asset Risk Management strategy, and how these have been identified.**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	List the key elements contained within the company's Asset Risk Management strategy with brief bulleted descriptions of their interaction with other policies and strategies.	I	• Key Performance Indicators • Frequency of reporting • Communication to relevant staff • Feedback on action and performance indicators • Inspection & maintenance policy • Resources – people & equipment • Suppliers • Spares capability • Customer focus • Security of supply including capacity • Budget constraints
b)	Is there a structured approach to risk identification for assets?	I & RI	• A risk register • Periodic review of risks • Integrated with wider risk register (as in Turnbull recommendations)

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
c)	When considering corporate strategy for overall staff levels how is this reconciled with the requirements of asset risk management and other network activities (e.g. new connections)?	I	• People plan • Reconciliation with planned activity • Age profiles and future shortfalls. • Retention and new recruitment
d)	What is done to ensure that the identified network equipment resource will be available when required?	FP	• Asset Management plan • Types and number of equipment required • Supplier requirements • Risks caused by equipment shortage • Review/modify future resource plans.

Q3	*Topic Area –- Narrative Question.* **Assigning Accountabilities** **Explain how the company assigns corporate and individual accountabilities for the medium/long term performance of the network and its assets.**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**

a)	Are accountabilities/responsibilities identified and formally agreed with individuals?	I	• The reporting/accountability process for asset issues is integrated within the wider management performance system at all levels
			
			• Supporting medium/long term network performance objectives
			
			  • Targets for individuals at and below the highest level of management through…
			
			  • Individual medium/long term network performance objectives
			
			  • Periodic progress reviews and resolution of problems with progress
			
			  • Incentivisation for individuals and/or teams

Q4	*Topic Area –- Narrative Question* **Structures and Contracts** **How has the company identified that its current organisational structure is the correct one, in terms of good Asset Risk Management planning and risk mitigation, throughout the company?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	What do you regard as the key factors of the organisational structure for delivering medium/long term asset performance objectives?	I	If the management of the network is contracted to a separate external or internal service provider then: • Where are the following accountabilities – and what is the rationale? - Ownership - Business strategy & direction - Asset & network strategy - Asset lifecycle management - Asset lifecycle work delivery
b)	What arrangements are in place for the ownership and management of the assets? Is it all in-house or are some aspects out-sourced?	FP	
c)	How are internal and external contractual arrangements managed and reviewed to ensure medium term network performance objectives are met?	FP & RI	• Medium/long term objectives expressed in contractual requirements • Delivery of objectives within a short term or terminable contract • Review of contractual arrangements • Monitoring of actual progress against objectives

Q5	***Topic Area –- Narrative Question*** **Operating, Integrating and Interpreting** **How is information used to provide assurance of medium /long term network performance?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	What are the key processes for information to inform the policies? How are they implemented?	I	• The company has undertaken a study to understand the link(s) between the condition and performance for all assets. • Link between asset condition and asset/network performance • Link incorporated into the asset register and the asset management decision process • Validation of performance, e.g. the reliability of the asset
b)	What are the key factors in defining which asset conditions are critical to medium/long term performance of the network?	FP	
c)	What other interactions on the asset life, condition or performance are assessed in determining the policies?	I	

Q6	*Topic Area –- Narrative Question* **Risk Assessment and Decision-Making** **What is the process for making Asset Risk Management decisions?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	Does the company carry out risk analysis studies of the decisions made?	I	• Scope, depth and comprehensiveness of risk analysis studies • Risks identified • Acceptable levels of risk • Integrated approach to risk, or separate • Breadth of application, e.g. assets, skills and resources, logistics
b)	What specific policies has the company formulated to manage the risks identified?	FP	• Mitigation of the effects of risks that have been identified as unacceptably high. • Monitoring the effect of risk mitigation actions.

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
c)	Does the company use a formalised methodology for decision support?	FP	• Methodology • Quantified risk information used in action planning • Consistency of approach • Communication to decision makers • Review of methodology • Effectiveness.
d)	Has an overall Risk Analysis been carried out for the performance of the network?	I	• Company wide network performance Risk Analysis study • Performance as seen by customers (e.g. reliability, availability, quality) • Approval/review by senior management • Future changes • On-going/repeatable • List other risk assessment areas that have been considered.

Q7	*Topic Area –- Narrative Question* **Audit and Accreditation** **Describe the corporate review process for the Asset Risk Management Strategy, including how it is audited and accredited.**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	How are policies and policy changes managed and applied across the company?	FP	• Policy change communication and training staff of new policy/procedures • Audit to verify compliance with stated policy • Shortfalls in compliance • How revisions are made and what drives the changes
b)	To what extent has accreditation to national/international standards been achieved across key processes?	FP	• Company policy towards process certification • Standard for key Asset Management processes • Asset Management process audits
c)	In terms of medium/long term network performance, does the company learn from industry best practice from other relevant organisations?	RI	• Benchmarking • Other companies

Section B Asset & Network Strategy

Q1	*Topic Area –- Narrative Question* **From Policy to Procedure** **How are Asset Management policies, set at Corporate level, translated into working procedures?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	Does the company document Asset Management procedures and do these get communicated to the correct staff?	PP	• Communication to the appropriate staff and on-going accessibility by staff. • Associated training plan • Monitoring the quality of the work carried out under the new procedure.
b)	How frequently are the procedures reviewed?	PP	• Procedure review • Verification and comparison of performance levels • Achievement of expected performance levels • Actions to address any differences • Review of procedures on a regular basis
c)	How does the company ensure effective implementation of a policy change within the procedures?	RI	
d)	Does the company verify the level of performance achieved by the change against expectation?	RI	

Q2	*Topic Area –- Narrative Question* **Recording Asset Information** **How does the company ensure that the relevant asset information is recorded and available to feed corporate decisions/policies?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	Is there a register on which assets are recorded? Does this include their condition/performance/serviceability? How often is it updated?	PP	• Identification of asset register requirements needed for effective asset risk management • Specifications allow for future scope & development of the system and network itself • Management process identified and documented • Resources identified to ensure effective use • User interface – single interface/register, or multiple interfaces/registers.
b)	Has the company identified and documented the content and user requirements of its asset register to ensure effective Asset Risk Management?	PP	

Q3	*Topic Area –- Narrative Question* **Defining Asset Life and Serviceability** **How is asset life and serviceability defined and how is it reviewed?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	How does the company ensure that the previously defined critical asset conditions, that are also important to asset life and serviceability, are translated into a suitable procurement specification?	PP	• Asset performance. • Key attributes including network activities performed on asset • Procedure for specification to supplier • Procurement specification format, contains requirements information that can be traced back to asset performance objectives, with the facility for update and improvement • Supplier's understanding of purpose and expectations of the asset

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
b)	What procedures does the company have to monitor and record the condition of an asset and link this to its performance?	PP	• Capture of information • Condition indicators • Asset register link • Links between the reported condition and asset serviceability • Condition information used to make decisions on asset life and serviceability • Asset/network-modelling techniques & the use of actual recorded information to assist asset life and serviceability studies
c)	What process is in place to compare and review actual asset condition with the expected condition?	PP & RI	• Inaccessible assets (for example buried pipes and cables) • Capture of asset information during planned work i.e. other than inspections take place
d)	How is this comparison used in further asset planning?	PP & RI	• Development of policy for future assessments of condition and serviceability

Q4	*Topic Area - Narrative Question* **Innovation and New Technology** **How does the company manage innovation and introduction of new technology that could impact on long-term network performance?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	Does the company have a procedure to address the procurement of new assets/technology and if so, what risk analysis is done prior to the adoption of new technology?	PP	• Strategy for the introduction of new assets/technology • Linked to the expected benefits. • Identification and quantification of risks from the new technology • Level of acceptability
b)	Are control measures put in place to manage the identified risks and is the procedure for this documented?	PP	• Review the effectiveness of control measures • Installation, operation, maintenance and de-commissioning of new assets. • Staff training and equipment

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
c)	How are medium term network performance objectives used to drive the search for new assets/technology?	PP	• Nominated responsible person or team • Identification of opportunities with key asset/network decision-makers. • External links to ensure that new technologies, practices and experiences are learnt from other parts of the industry, manufacturers and R&D providers
d)	How does the company keep abreast of new technology or innovation in assets and Asset Management techniques?	PP	
e)	What is the process for approving the use of new technology or innovation in assets or asset management techniques?	PP	
f)	How does the company track the performance of new technology or practices against expectation?	PP	• Operational performance requirements detailed in asset specifications • Assurance of the manufacturing quality of suppliers • Policy on field trials/tests • Variations between expectation and actual performance • Influence on future asset acquisition processes.

Q5	*Topic Area –- Narrative Question* **Security of Supply and Asset Utilisation** **Security of Supply is a key element of good Asset Management. How does the company take account of Security of Supply in an Asset Management policy?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	What is the approach used to identify risks to security of supply?	PP	• Methodology to identify and quantify the risks and assumptions associated with supply security, both within and beyond established security standards • Are exceptional events included? • Plan for mitigating the risks and/or recovering from events • Sensitivity analysis on risks and assumptions. • Identification of high risk/high sensitivity regions or groups of customers • Emergency plans to manage exceptional security of supply events .
b)	On what frequency does the company review the risks to security of supply?	RI	

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
c)	What procedure is used by the company to forecast the capacity requirements for the network for the medium/long term?	PP	• Methodology for forecasting future capacity requirements • Factors taken into account when forecasting future capacity requirements of the network • Effectiveness of forecasting reviewed on a regular basis • Capacity shortfalls – assets at or beyond nominal capacity • Structured use of short term ratings of assets

Q6	*Topic Area –- Narrative Question* **Compliance with Legislation** **How does the company ensure that compliance with legislation, regulations and standards is achieved and how is it integrated with the asset risk management decision processes?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	Does the company have a structured process to keep standards and other requirements under review for changes outside the company?	PP	• Responsibilities for monitoring the requirements of new legislation, regulations and other external standards • Procedure for the assessment of implications for future Asset Management Strategy • Identification of associated risks, quantification and the route to modification of asset management plans • Compliance and how compliance is assessed
b)	Does the company carry out an impact analysis to assess how the changes will impact on current Asset Management Strategy?	PP	
c)	How are changes in legislation, regulations and standards applied throughout the company?	PP	
d)	How does the company assess that compliance has been achieved?	RI	

Section C Asset Life Cycle Management

Q1	*Topic Area –- Narrative Question* **From Procedure to Delivery** **How are the Asset Management procedures delivered? How are the elements of Asset Life Cycle managed?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	How does the company ensure that agreed Asset Management procedures and practices are actually implemented, day to day?	M	• Compliance with procedures
b)	How is the effectiveness of these procedures and practices measured, and over what time-scales?	M	• Key attributes defined • Comparative data • Measurement of improvement • Time scales defined

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
c)	What measured outputs are recorded and how are these used to compare with, review and adjust procedures and practices?	M	• List outputs measured • Method of recording • Comparison • Review • Adjustment procedure
d)	How does the company learn from incidents and near misses?	RI	• Reviewed for lessons learned • Structured approach to review • Action points derived • Tracked to completion

Q2	*Topic Area -– Narrative Question* **Asset Register Contents** **How is asset information recorded and updated?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	How does the company ensure that changes in asset populations are recorded on the asset register e.g. from commissioned and decommissioned items, and over what time-scales? How are errors in the register identified and addressed?	M	• Asset types • Sufficient linkages existing between multiple registers • Asset information logged • Network activities that will affect asset performance • Asset condition and performance • Deterioration • New and removed assets • Linkage between asset register and geographical information systems (e.g. mapping for locations/fault monitoring from customer calls) • Feedback from the field

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
b)	What checks are carried out to ensure that locally or remotely captured asset condition information is accurately recorded on the asset register? What is the current level of accuracy?	M	• Management process • Audits • Resource and appropriate skills • Information for network modelling. • Condition, condition trend and performance • Asset management decisions
c)	How is performance measured, in respect to the accuracy and timeliness of updating asset information onto the register? What is the current level of compliance, in quantified terms?	M	
d)	How does the company monitor whether condition information recorded on the asset register actually initiated the appropriate actions e.g. repair/maintenance/capital investment? What is the current percentage of situations where this has occurred? How is the effectiveness of this measured? Can you provide numerical analysis?	M	

Q3	*Topic Area — Narrative Question* **Utilisation** **How is the utilisation of assets assessed?**

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
a)	How does the company monitor actual demand on the assets/network, at which parts of the network and how frequently?	M	• Capacity monitoring – appropriate performance indicators • Review and comparison of data • The differences between actual and targeted levels of demand and capacity are used to re-design the network
b)	How is actual demand compared to asset/network capacity and how are anticipated shortfalls against nominal capacity addressed? Over the next business plan period, how many identified shortfalls are there for which there are no approved solutions?	M	
c)	How are actually recorded demands compared with previous assumptions and models? What current levels of accuracy has modelling achieved?	M	

Q4	*Topic Area — Narrative Question* **Use of Contractors/Suppliers** **How do you manage the use of contractors/suppliers and their effectiveness on Asset Risk Management?**		
Ref.	**Topic Area Sub-Questions**	**Scoring Area**	**Areas of Consideration**
a)	What indicators are used to monitor the overall performance of network/asset service providers, internal and external? How are the performance indicators measured? What is the current quantified level of performance?	M	• Performance Indicators for asset management • Measured contractor performance on asset management • Addressing shortfalls in performance • Checking quality of workmanship
b)	Have there been formal joint reviews of contractor performance?	RI	
c)	How has the performance shortfalls of contractors been addressed by the company? Have actions been agreed or taken to address these? What levels of performance improvement have been achieved from these?	M & RI	
d)	How does the company continually assess the quality of contractors' work? Are quality levels quantified and recorded – if so what are the current levels?	RI	

Q5	*Topic Area -– Narrative Question* **Inspection & maintenance regimes** **How is the inspection and maintenance regime derived, and how is its effectiveness monitored?**

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
a)	How does the company measure compliance against its policy for Inspection and Maintenance intervals (either time or condition based)? What is the current, quantified level of compliance?	M	• Procedure for the delivery of the inspection and maintenance policy • Completion of work at the stated intervals (time or condition) • Records are kept of work carried out on routine inspection and maintenance • Record includes details of condition found • Form of information captured (e.g. on paper or on a hand-held computer so that it can be uploaded directly into the company's database) • Delay period for recording these details • Company range of access to information
b)	What is the current level of historic backlogs, and how are these being addressed?	M	
c)	How does the company ensure that details of work carried out and conditions recorded are properly recorded and effectively communicated to the asset register?	M	

Ref.	Topic Area Sub-Questions	Scoring Area	Areas of Consideration
d)	How is the quality of Inspection and Maintenance work assessed? Is there a schedule of quality checks in place? What is the level of achievement against quality check schedules?	M & RI	• The company ensures that inspection and maintenance staff remain trained and competent to carry out the work • Supervision and monitoring of the work, Quality Assurance of this. • Schedule of refresher training in inspection and maintenance skills • Staff are equipped to perform the work • Systematic process • Regular review • Trends identified and tracked
e)	Do you review and modify inspection and maintenance regimes in the light of operational, safety and environmental incidents?	M & RI	

Asset Risk Management Survey

Composite Industry Report

December 2002

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1 Introduction

Asset risk management is an important part of the process of ensuring longer-term network performance. Ofgem is seeking to promote greater visibility of asset risk management in the transmission and distribution of electricity and gas. The key aims of this initiative are as follows:

- To allow Ofgem to gain reassurance of the quality of the approaches being adopted by the network companies to the risk management aspects of their stewardship of the asset base
- The identification and encouragement of good practice in the area of asset risk management

To fulfil the aims of this initiative Ofgem has initiated an Asset Risk Management Survey. The survey has been prepared on behalf of Ofgem by British Power International, ERA Technology and Mott MacDonald. They have been retained by Ofgem to assist in the first year of the survey's development and implementation.

The 2002 survey was designed to explore the asset risk management approaches of the electricity and gas network companies and it is the first stage of an evolving process. It has provided valuable information in understanding how the companies carry out the process of asset risk management and it has highlighted areas of the survey where further development will enhance it for future years. The limitations placed on the survey by being a first year and the fact that it is part of a learning process, indicate that the 2002 results should be the interpreted as useful indications of the extent of development and application of asset risk management in the companies studied rather than definitive findings. This is one of the reasons why full company results are confidential to Ofgem and each company, with this consolidated industry summary provided for public reporting. The participating companies are named in Section 2 of this report but their individual results, although reported here are not attributable. This form of anonymous reporting is consistent with international benchmarking practices.

The success of this first stage was very much dependent on the companies' voluntary participation in the survey. All companies embraced the concept and their help in this regard is gratefully acknowledged.

This paper presents the results of the 2002 survey and the findings are set out in this paper in the following manner:

- Section 2 describes the methodology adopted in the design, delivery and analysis of the survey. This section includes a brief discussion of the contents of the survey, the scoring methodology employed and a description of the process undertaken to deliver the survey. It also comments on the limitations of the survey and the lessons learnt.

- Section 3 presents the results. These are summarised using radar plots and also by discussing general trends that have been observed through analysing company specific data. It also provides an illustrative example of leading practice and a summary of the areas where companies are strong and where they may need some improvement.

- Section 4 sets out the way forward with lessons for the future and topics for further discussion.

- The appendices contain the radar plots, which represents the assessed scores for all companies; these are not attributed to individual companies.

2 Methodology

Section 2 describes the methodology adopted in the design, delivery and analysis of the survey. This section includes a brief discussion of the contents of the survey, the scoring methodology employed and a description of the process undertaken to deliver the survey. It also comments on the limitations of the survey and the lessons learnt.

2.1 Introduction

The approach followed by the Consortium has three main elements:

- Design of the survey
- Delivery of questionnaires and audit visits
- Analysis of the results.

A brief summary of each element is given in the following sections. (For full details refer to the Consortium's Report *Asset Management Survey, A Survey Guide*, submitted to Ofgem in July 2002).[1]

This section also comments on the limitations of the approach taken and the lessons learnt in the delivery of the survey.

2.2 Survey content

This section covers how the survey was developed and formulated.

The survey was designed to be generic and applicable across all sectors within the industry. Accordingly, the same survey was employed to explore asset risk management in the following energy network companies:

- Electricity distribution:
  - Aquila
  - East Midlands Electricity
  - LPN and EPN
  - Northern Electric Distribution Limited
  - Scottish and Southern Energy
  - SP Distribution plc (including SP Manweb plc)
  - SEEBOARD Power Networks
  - United Utilities
  - Western Power Distribution
  - Yorkshire Electric Distribution Limited

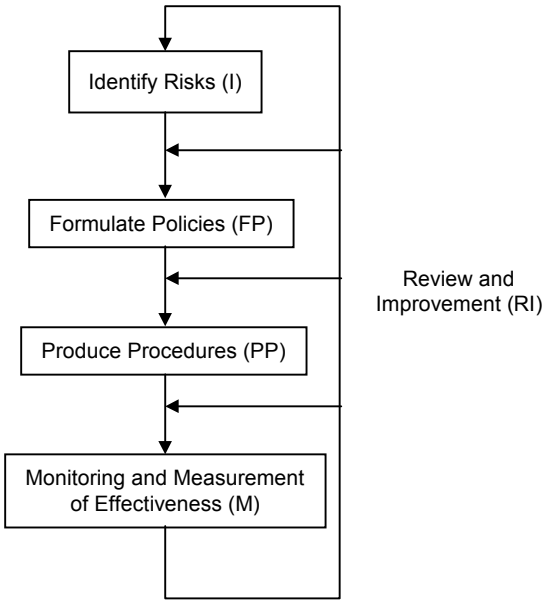
[1] http://www.ofgem.gov.uk/newprojects/assetrisk_pubs.htm.

- Electricity transmission
  - SP Transmission plc
  - Scottish and Southern Energy
  - National Grid
- Gas distribution and transmission:
  - Transco

Note - There are only 12 sets of results (radar plots), as some companies with both distribution and transmission assets or two distribution licence areas, adopt basically similar asset management approaches to both sets of assets. They are therefore each represented by one plot. This also serves to protect anonymity.

The survey employs a simplified model of a generalised risk management process and has been based on a number of theoretical models. (See Figure 1) Other models exist, such as those contained in HSE guidelines and quality management standards such as ISO 9000 and ISO 14000. It is considered that the simple high-level model in Figure 1 embodies the theories underlying these other models and, combined with the content of the proposed questionnaire, is sufficiently robust to allow the exploration of the asset risk management process at the level required for this survey.

Figure 1: Risk Management Model



The questions in the survey were structured to investigate this risk management model for the categories as proposed in Ofgem's consultation document of November 2001. These broadly reflect the key areas within a company where asset risk management activities take place. These are:

- Category A: Business Strategy and Direction
- Category B: Asset and Network Strategy
- Category C: Asset Life Cycle Management

In the 2002 survey questions were included under Category C to explore the following areas in more detail, and to provide quantified assessments of the companies' performance in those areas:

- Asset registers
- Utilisation of assets
- Use of contractors/suppliers
- Asset inspection and monitoring regimes

These selected topics were included to probe specific operational areas. It is envisaged that this section of the questionnaire will change on an annual basis to explore the effectiveness of the process in different areas.

The questionnaire was designed to assess the asset risk management process across all the three main categories, allowing the assessment of how the risk management process feeds through from the corporate level, through the asset strategy level to effective 'on-the-ground' application of the risk management process.

2.3 Delivery of the Survey

The survey was delivered as a two-part process.

- Questionnaires were sent to companies for completion and return
- Audit visits were undertaken to probe and clarify the companies' questionnaire responses

2.3.1 Questionnaires

A questionnaire was formulated to elicit information from each company on their approach to asset risk management. The questionnaire was divided into three sections to correspond to the categories identified in section 2.2. Within each of the three main categories key topic areas were identified and a series of questions at both high and more detailed level were asked. The survey questions were structured to test for integration of information flows between the three categories. They were also designed to check how effectively processes are being applied and how companies are monitoring and reviewing their effectiveness in order to continuously improve asset risk management techniques.

Companies were encouraged to submit focused responses by limiting the number of words provided in their replies and by allowing them to cross-reference their responses to other questions. The limitation of words was also important to ensure consistency and fairness when assessing responses.

2.3.2 Audit visits

The response to the questionnaire was the first stage of the survey process. To ensure that the assessment of the companies' written responses was as rigorous as possible, follow-up visits were carried out. These probed issues further where it was considered that insufficient or inconsistent information may have been provided at the questionnaire response stage and to confirm the information provided for some questions. To allow companies adequate time to prepare for the audit the areas that were to be covered during the audit visit were notified to them in advance.

The audit visits were limited to one day per company and the audit teams contained a mix of industry experience and knowledge, as well as audit competency. The auditors had a common survey manual that provided them with an objective means by which to seek evidence and assess performance. To avoid the potential for 'reverse-engineering' of results, this auditor's manual was not available to the companies.

2.4 Analysis

The company responses to the questionnaire were initially assessed based on a scoring methodology. This is summarised in Table 1.

Table 1: Scoring Summary

Level of Process Development	***Guideline for extent of application***	***Points Awarded***
Process fully integrated and effective across the whole company	>90%	5 points
Process mostly in place but not shown to be integrated and effective across the whole company	75%	4 points
Process development complete to moderate extent and/or not applied to notable areas of company asset activities or regions	50%	3 points
Process under development and/or applied to only some areas of company asset activities or regions	25%	2 points
Little or no evidence of process and/or limited application across company asset activities or regions	<10%	1 point

Note: Maximum points may not necessarily equate to best practice – please see comments in section 2.5.3.

To score the key topic areas for Categories A, B and C, the quality of evidence provided in the response to the main question and the sub-questions was assessed. From the response to the main question and sub-questions, the auditors formed an understanding of the company's asset risk management approach for that key topic area. During the audit visit, auditors verified the extent of, or absence of, the evidence available to support the responses, particularly where responses to the questionnaire were considered insufficient.

The final score awarded depended on both the extent and level of development of the risk management process and the range of application of the process across the asset types and across the organisation.

To ensure that all survey teams applied the scoring methodology consistently, guidance was provided and also the scores generated by each team were reviewed and the assumptions and statements made by the audit team were questioned.

2.5 Characteristics of the Survey

2.5.1 Scope and timing

The survey was designed to cover a wide range of themes within a limited timescale and with the audit visits being limited to one day per company. These factors together limited the in-depth understanding that could be obtained, but this was to some extent offset by the open format of the survey questionnaire completed by the companies. The exercise proved useful in providing information, which was otherwise not available, on how asset risk management is carried out within the network companies. It revealed an understanding of the range of different approaches used by the companies, as well as areas of good practice that could possibly be shared within the industry. This will enlighten the structuring of future surveys and it will direct further in-depth analysis in the future. It is important to realise that the survey was based on a snapshot of the companies' approach to asset risk management at the time of the survey. Although individual company reports have acknowledged, where appropriate, those areas currently under development by the companies, assessed scores reflect the degree of development found at the time of the survey.

2.5.2 Questionnaire/audit Process

As already mentioned, the companies' written responses were word limited. Some companies were able to work within this constraint more effectively than others. The impact of this restriction was limited by the two-tier questionnaire/audit process used for the delivery of the survey. This proved to be useful because it allowed the companies and the auditors to target their efforts and to correct false impressions. For example, in some cases, companies' asset risk management capabilities were overstated in their written response and found weaker during the audit process. In other instances, the auditors found that companies had undersold their capabilities in their written responses and were able to gain a more complete view during the visits.

2.5.3 Effort versus Return

One important issue that has been raised by some companies is whether sufficient regard has been paid to the question of effort versus return, with respect to the degree of development of their asset risk management approaches. Higher scores indicate those companies that have developed a greater depth of implementation to their asset risk management approaches. In contrast, some companies judge that the benefits to asset risk management of this degree of implementation do not give them sufficient benefit to warrant the effort required. A good example of this is the definition, collection and recording of asset condition information; some companies routinely collect and act on condition information that has been defined from a risk analysis exercise, and this has been assessed by them as an effective approach. Other companies consider that the effort involved in doing this is insufficiently rewarded by benefits to long term stewardship and have consciously not adopted such an approach.

The issue of how to recognise the effectiveness of the chosen degree of development, whilst at the same time acknowledging the highly developed approaches adopted by some companies, will benefit from wider debate, and will help to inform the approach adopted for future surveys.

Fundamentally, whilst a greater "extent of development" may permit more effective management of asset risks, such extra development comes at a cost and therefore future surveys could usefully place additional focus on whether such development provides value for money to the customer.

Ofgem has consistently stated its view that there is no single correct model for asset risk management implementation and that each company will, quite rightly, determine the priorities for its own business and its customers. The benchmarking information revealed by the survey will no doubt, help inform companies decisions in this regard.

3 Survey Findings

3.1 Radar Plots

3.1.1 Approach

Diagrams have been chosen to provide a simple representation of overall process development in the many areas encompassed by the survey. The most appropriate format for expressing this information is in the form of a series of 'radar plots', an example of which is shown in Figure 2 below. These allow rapid assimilation of multi-faceted results.

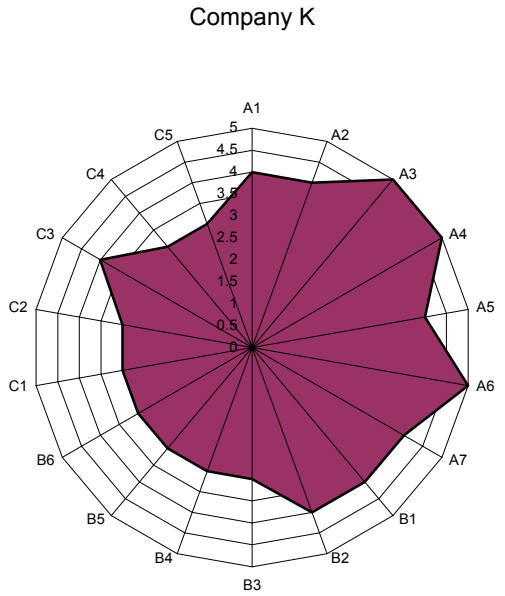
The radar plots indicate individual companies' assessed scores for each of the main questions, across all three categories of the survey. In this way the degree of process development, can be easily identified, and related to the relevant category and its question area.

It is important to recognise that it is inappropriate to summate a company's individual scores into a single total, and to use this figure to compare with the total scores relating to other companies. Such comparison would not provide an accurate or useful ranking of overall inter-company performance. The reason for this is two-fold: firstly each question carries unequal weighting in terms of its contribution to the overall approach and, secondly, company effectiveness depends on interactions between individual question areas. The value of the radar plot to each company is to indicate their own areas of greater or lesser development, to compare these to those of other companies, and to help them to make decisions on how the development of their asset risk management process might progress.

For Ofgem, the radar plots indicate the upper and lower bounds of activity and provide a first assessment of assurance that network companies are addressing this range of key topic areas.

The radar plots are a snapshot and may not adequately represent all areas of company performance in the survey. For example, a medium ranking score in a particular category may be the result of particularly good asset risk management policy or process being in place only for a limited range of the assets. It is important that the value of the particular policy or process is recognised, and consideration given to its extension by the companies, where warranted in the future.

Figure 2: Example radar plot reporting of results



3.1.2 Company Results

The radar plot results for each company, which for this survey are not attributable to the companies, are shown in Appendix A. The appendix also contains a key to aid understanding of the radar plot axes.

3.2 General Trends

On average, and in general for each company, performance was strongest in Category A and lessened progressively through categories B and, more markedly, C. The strongest performing area related to *Assigning Accountabilities*, with companies scoring an average of 4.6. The least developed areas related to *Asset Register Contents* and *Inspection and Maintenance Regimes* with companies scoring averages of 2.8 and 3.1 respectively.

In general, companies demonstrated stronger levels of development in *identifying risk*, *setting strategy* and *assigning accountabilities* than in the delivery of the day-to-day procedures that had been developed to deliver them. As indicated above, a key area of limited development was the management processes for ensuring that defined asset conditions were collected, stored and acted upon to agreed standards of timeliness and content accuracy.

Overall performance in the areas of *security of supply and asset utilisation* scored 3.7, with a notably higher degree of development in place for the upstream networks e.g. the higher voltages of the electricity companies' systems. There was evidence that some companies are beginning to further develop their approach for the downstream networks, but there remains at present a marked difference in the extent of study and assessment between the two parts of the systems.

3.2.1 Key Themes for Further Consideration

Analysis of the survey findings has allowed for some key themes to be identified for further consideration. These are as follows:

- The time horizon that frames the approach to asset risk management
- The extent to which the company has identified the risks to medium/long term asset management, and how these risks are managed within policy, procedure and practice.
- How information relating to network assets is defined, captured and used to ensure effective asset management.

(i) Time Horizon

Companies adopted a range of different time horizons when setting their asset risk management strategies. Some companies had a long-term vision for the performance requirements of their networks, and had set themselves indicative network performance objectives a long way into the future, in some cases for up to 20 years. A suite of relevant key performance indicators usually supported these objectives. Whilst such companies understood the influence on these objectives of external drivers, including the outcomes of regulatory reviews, the existence of a long time horizon was seen to set the foundations for a more robust approach to asset risk management, and to enable the development of strategies and indicative work programmes to deliver the objectives. The companies considered as having the most developed approach tended to establish strategies and planning processes that were flexible enough to factor in changing requirements, thus ensuring a responsive process.

Some companies had a very limited time horizon, in some cases restricted to the current regulatory price review period, and they had adopted this approach due to the uncertainties of the outcome of the next regulatory review. In general this did not allow for a robust approach to medium/long term asset management, and policies and procedures set by such companies tended to contribute to long-term asset health intuitively at best, rather than in a demonstrably well-thought out and holistic manner.

The time horizon for resource planning, both for people and equipment, is generally short term, even for those companies with long-term horizons and objectives. Where indicative work programmes have been identified for many years ahead, in general this information has not been used to plan for the resources that will be required to deliver them. Very little is done throughout the industry to identify and tackle future risks and requirements of resourcing.

(ii) Identifying and Managing Risks

The majority of companies have developed good processes to identify and assess the risks to medium/long term network performance and, in some cases, have quantified those risks in terms of their probability and impact on network performance. Some companies have documented these risks into a well-managed Risk Register, which is integrated with their corporate register and thus allows for an integrated and balanced suite of mitigation approaches.

The strongest-performing companies in this area demonstrated clearly defined and systematic approaches to risk management and decision-making, including the use of a wide range of modelling tools. One company had developed a number of its own analysis tools, including a network performance analyser and an asset condition analyser. The combined use of these tools is actively used to develop optimum network strategies for some asset types, from risks identified in its risk identification process.

Some companies have a less developed approach to the identification and management of risks. In a few cases there has not been a comprehensive and documented risk identification exercise, although in most of these cases such an approach is now being established for the future. For these companies, the current approach is somewhat piecemeal and ad-hoc, and although decisions appear to contribute to asset and network health from the perspective of good engineering practice, the approach does not provide for the selection of optimum risk mitigation strategies.

In a few cases companies have performed robust risk identification analyses, and documented the results well, but have not followed this through by addressing unacceptable risks with identifiable procedures and work programmes. For these companies it is considered that their overall asset management approach would benefit from a review of the completed risk analysis and the introduction of a more systematic approach to rank and address the identified risks.

(iii) Defining, Capturing and Using Asset Information

One of the key themes of the survey was to assess how companies defined the asset related information that should be collected throughout the asset lifecycle, how effectively such information is collected and stored and how the information is used to inform decisions relating to medium/long term asset management.

Companies assessed as leading in this area demonstrated clear linkages between the analytical risk identification studies they had carried out, their inspection policies, the specification and management of asset registers and the use made of asset information by decision makers.

Key to this process was found to be company understanding of the links between asset condition and long term network performance. Some companies have carried out comprehensive studies to identify asset and network risks and have defined the asset conditions which impact network performance, in some cases quantifying these in terms of probability and impact. Some companies have used these defined conditions to derive their inspection and maintenance (I and M) policy, and routinely collect the asset condition information within their I and M programmes. The most developed companies have established asset register systems that are clearly specified to support their I and M policies.

Some companies have taken a conscious decision to limit the extent of condition information captured, and have adopted a policy of "reporting by exception", having defined acceptable limits from their risk identification studies. In some cases the exceptional limits are acted on but left unrecorded on the asset register. There is a significant variation between companies in the effectiveness of data capture management. The strongest performers in this area have specified and documented their asset register systems to clearly support their asset management strategy and procedures, with defined resource levels to ensure timely and accurate data entry. They have specified appropriate data capture technologies, and the use of mandatory fields to ensure that defined conditions are always entered. Strong players in this area are also developing inherent condition trending techniques, in order to improve the effectiveness of the use of captured asset data.

Lesser performers in this area tend to have numerous legacy asset register systems with a limited degree of functionality and interaction between them and which do not reflect and support changes that have been made to asset management procedures.

In general and for most companies, there are good, inherent controls to ensure that work recorded onto hand held data capture devices is well managed in terms of the timeliness and content of its recording into the asset register. There are far less effective controls in respect of information captured in paper format and this is an area of general weakness throughout the companies assessed.

Procedures to ensure that changes to the asset base are captured e.g. on commissioning and decommissioning of assets, are generally robust for above ground upstream plant, with control room and asset register driven controls often found to be in place. Procedures with respect to buried assets and downstream plant are far less robust.

In general, the data definition and capture process is better developed for above ground assets, particularly for single site plant e.g. at electrical substations, for which most companies have benefited from joint industry initiatives to define relevant asset conditions. The process with respect to overhead power lines is less well-developed, although some companies have improved in this area over the last 2-3 years; nevertheless the definition, capture and use of condition information relating to overhead lines generally lags that relating to single site plant. In the case of overhead lines, the approach is generally to capture historic circuit performance, rather than asset condition, and to analyse this information in order to inform decision-making. This is an area that would warrant further consideration and would benefit from the sharing of best practice for predicting and assessing the risk of line failure.

The approach to the management of underground power cables differs significantly to the approach to other power assets. Most companies do not have a pro-active approach to the management of their solid dielectric cables (although most do have a more pro-active approach to the management of pressurised, monitored cables). At best, with some exceptions, historic fault performance analysis is used to inform decision-making. Most companies don't have confidence in the technical effectiveness or cost benefit argument of condition monitoring techniques for underground cables, and have not adopted this technology to any significant degree; one exception to this is the work presently underway within one company to develop some of these technologies. Most companies do not take the opportunity to assess and record cable condition when it is fortuitously exposed; there is one exception to this, with one company now doing so as part of its documented procedure. Few companies have a systematic approach to cable failure analysis, and so lose the opportunity to understand failure modes and trends for the future. In general (with very minor exceptions) the approach to the management of solid underground cables is not systematic or proactive.

3.2.2 Areas of Good Practice

During the survey examples of good practice were identified that could be used as a model for other parts of the industry. In line with the companies' wishes for confidentiality, examples of these are reproduced without reference to the company involved.

(i) Category A: Business Strategy and Direction

- A well-defined methodology used to score and rank identified risks within the risk register, and to identify investment prioritisation.

- Letter of Compliance used to ensure that individual engineers' areas of responsibility comply with company policies and procedures, in conjunction with a performance management framework.

- The development of asset condition and network condition analyser models and the use of these to inform asset management decision-making.

- The use of a Risks and Issues Management database, which assigns individual ownership, monitors and tracks progress and manages outstanding mitigation actions.

(ii) Category B: Asset and Network Strategy

- A pro-active approach to collect and record condition information relating to buried assets, where practicable.

- A strong approach to the introduction of new technology; R and D strategy is documented, clearly driven by performance and business objectives and implementation managed by a steering group structure.

- Establishment of a central records update facility to manage all aspects of asset data collection and recording.

(iii) Category C: Asset Life Cycle Management

- A strong quality control process used to monitor the compliance and workmanship of external contractors, including the use of a strong independent audit framework.

- The comprehensive network utilisation assessments undertaken to ensure compatibility with future load requirements.

- Policy rules for asset management are directly translated into practice through the asset data management system, which allows policy changes to be rapidly and comprehensively applied to all relevant activities. The functionality of system also facilitates the handling of immediate issues, such as operational restrictions.

4 The Way Forward

4.1 Lessons Learnt

Since this was the first survey of its kind undertaken by Ofgem, it was anticipated that lessons would be learnt about its process and content and that these would be used to inform and shape the approach used for future surveys. The key lessons learnt were as follows:

- Although the survey was structured to assess integration of approach across the three categories, nevertheless there was some unnecessary repetition across some questions, which in some cases served to confuse the company as to the response required.

- Elements of some questions were judged, during the audit, to be less relevant to medium/long term asset risk management than others. Although the relative importance of these has been reflected in the assessed scores, some of these could be dropped from future surveys.

- The principle of a small and constant audit assessment team proved successful in ensuring that companies were assessed consistently and fairly.

- Some companies appeared to put less effort into their written response than they did the on-site audit, despite the fact that some question areas were assessed solely on the company's written response. The scope of the on-site audit may have been over-estimated by some companies.

- The time and resources available to the survey audit team were necessarily limited, allowing only a high level assessment, which was highly dependant on the quality of the companies' written response and the evidence they presented at audit.

- The schedule of audits entailed some back-to-back visits, which did not allow sufficient time to fully reflect on the evidence seen.

4.2 Next Steps

Consideration of the results and the process to obtain them, is now required, recognising that Ofgem seeks (a) assurance of good asset stewardship, testing this in the widest possible context, and (b) to promote good practice across the regulated electricity and gas network companies, where each company has responsibility to develop and implement strategies according to its own risk assessments and priorities.

In order to discuss the results of this year's survey, both in terms of the radar plots and areas of good practice, an Industry Seminar is planned for respondees in January 2003. This will also consider the lessons learnt regarding the practicalities of the survey process and will highlight any topics for attention. Options for future surveys will be explored.

This will also be discussed with the Electricity Association, who represent many of the companies involved in this years survey.

To foster wider awareness of the survey and its findings an Open Seminar is also being planned. This will be arranged in conjunction with a relevant Learned Society, such as the Institute of Asset Management. This will permit discussion of the extent of asset risk management in Ofgem's regulated network companies compared to other regulated businesses and/or asset intensive sectors. As there are currently plans to formulate a general 'standard' for asset management, it will also share understanding of the practicalities of measuring asset risk management performance across the broad range of areas included within the scope of this years Ofgem survey.

4.3 Suggested Issues for the Industry Seminar

(a) Process Review — lessons from development of the survey questionnaire and its implementation, from the audit visits, and from the follow-up processes, and from the results presentation

(b) Best Practices — with the agreement of the companies concerned, a sharing of their experiences with particular reference to the "effort versus return" justification

(c) Topics for Attention — to consider any common views on asset risk management matters that warrant further attention and how they might be progressed for mutual benefit.

(d) Way forward — a pooling of ideas for developing the Asset Risk Management Survey, including timing and format and topics for particular attention. Ofgem would wish to see a sufficiently robust process developed to enable company names to be attributed. Clarity is likely to be required on the prospective uses of any measures generated and how they might relate to other Ofgem programmes e.g. Price Reviews, IIP etc.

4.4 Wider Audience

An Open Seminar would provide an opportunity to

(a) communicate the findings of the survey and experience with the methodology to a wider audience of asset risk management practitioners and other interested parties

(b) present this in the context of views and experiences from sectors other than the electricity and gas networks, so that development of future surveys might be better informed

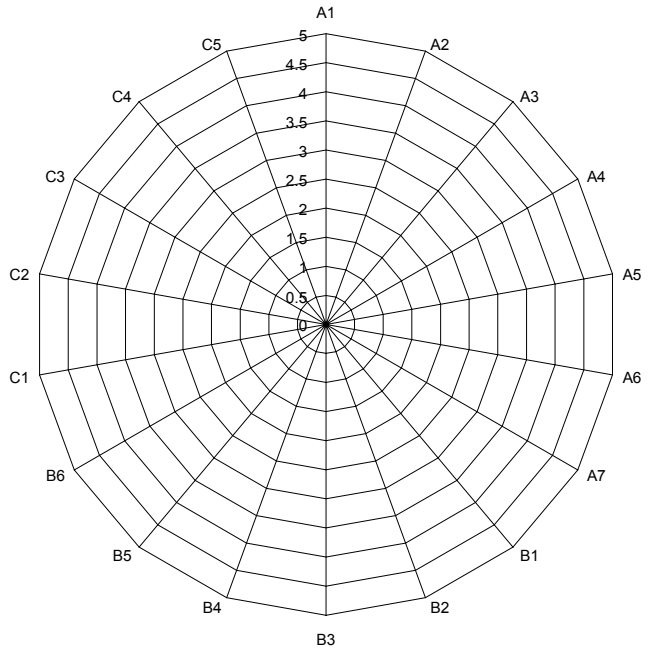
5 Radar Plots

KEY TO RADAR PLOTS

	Section A **Business Strategy & Direction**
A1	Aims and Objectives
A2	Identifying Key Issues for Asset Risk Management
A3	Assigning Accountabilities
A4	Structures and Contracts
A5	Operating, Integrating and Interpreting
A6	Risk Assessment and Decision-Making
A7	Review Process

	Section C **Asset Life Cycle Management**
C1	From Procedure to Delivery
C2	Asset Register Contents
C3	Utilisation
C4	Use of Contractors/Suppliers
C5	Inspection & maintenance regimes

Radar Plot for Company Audited

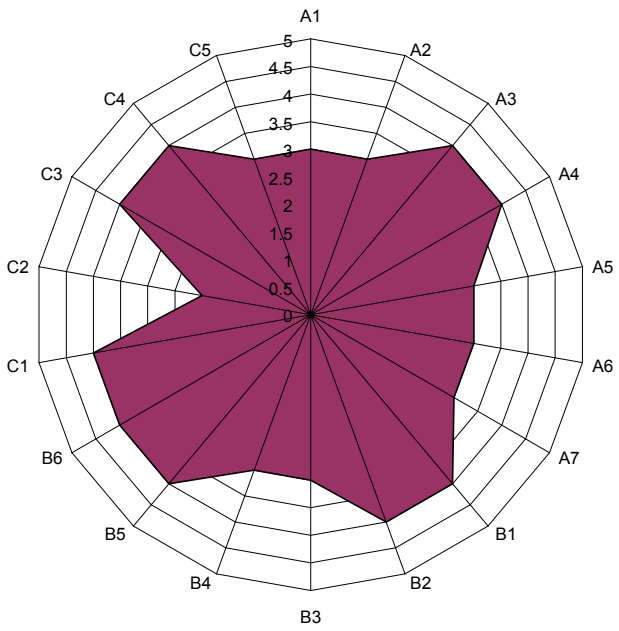


	Section B Asset & Network Strategy
B1	From Policy to Procedure
B2	Defining Asset Life and Serviceability
B3	Recording Asset Information
B4	Innovation & New Technology
B5	Security of Supply and Asset Utilisation
B6	Compliance with Legislation

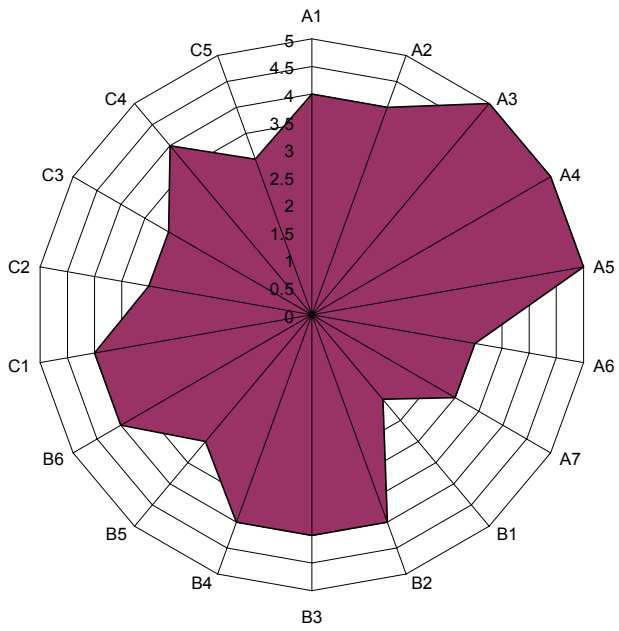
Score	**Classification**
5	**Leading**
4	**Above Intermediate**
3	**Intermediate**
2	**Below Intermediate**
1	**Trailing**

Radar Plots for Companies A to D

Company A



Company B



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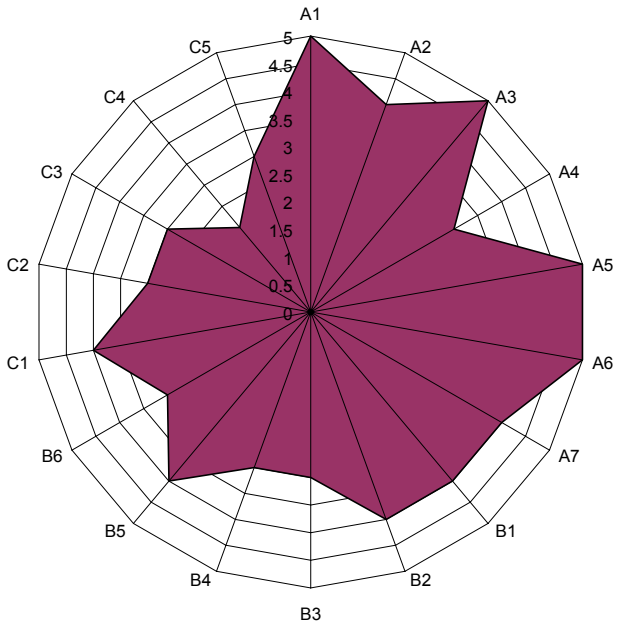
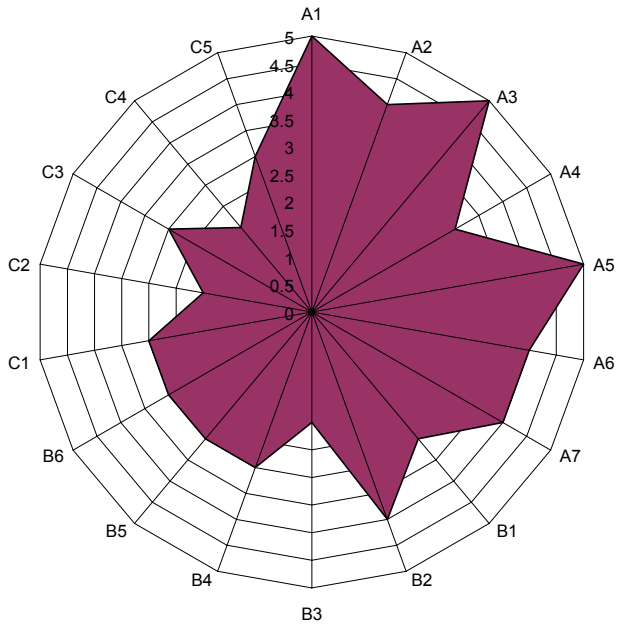
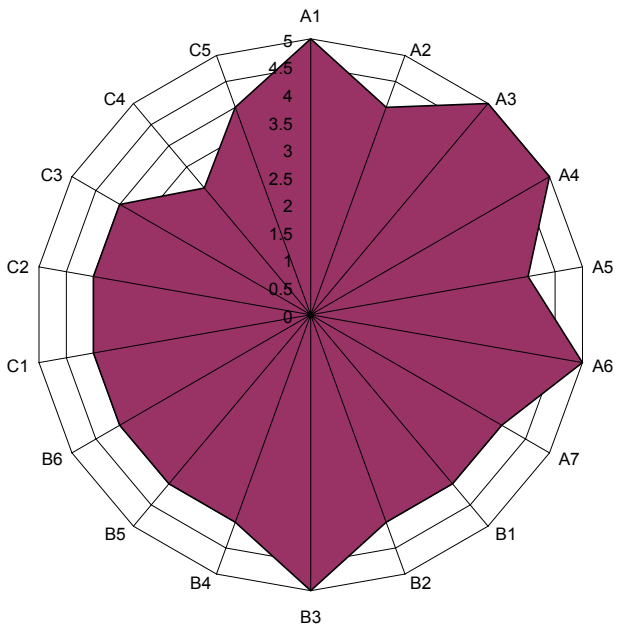


Company D

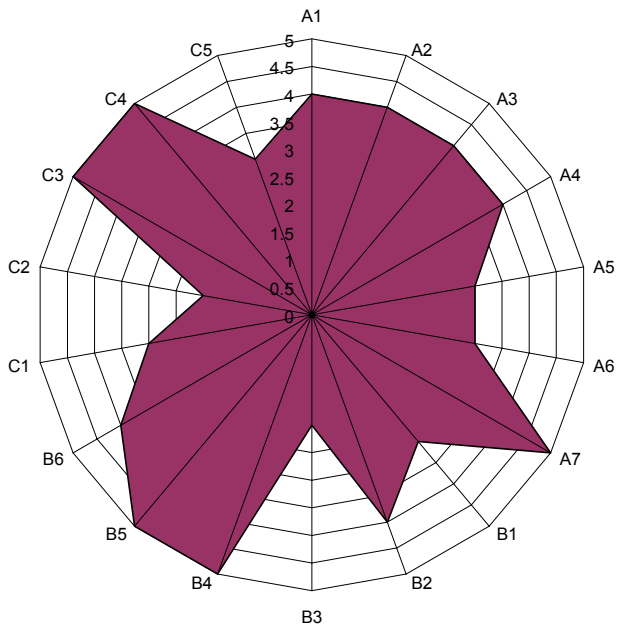


Radar Plots for Companies E to H.

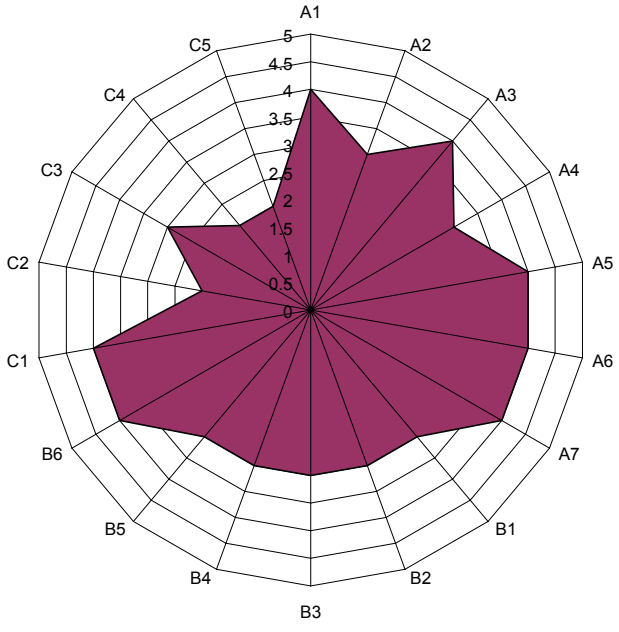
Company E



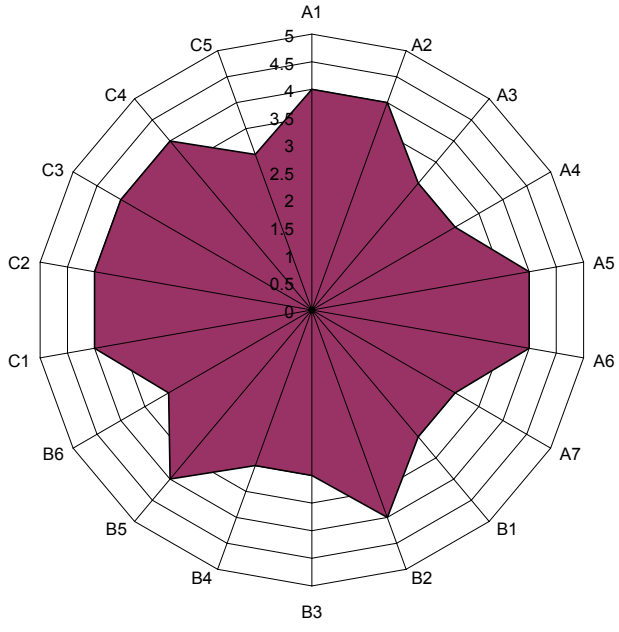
Company F



Company G

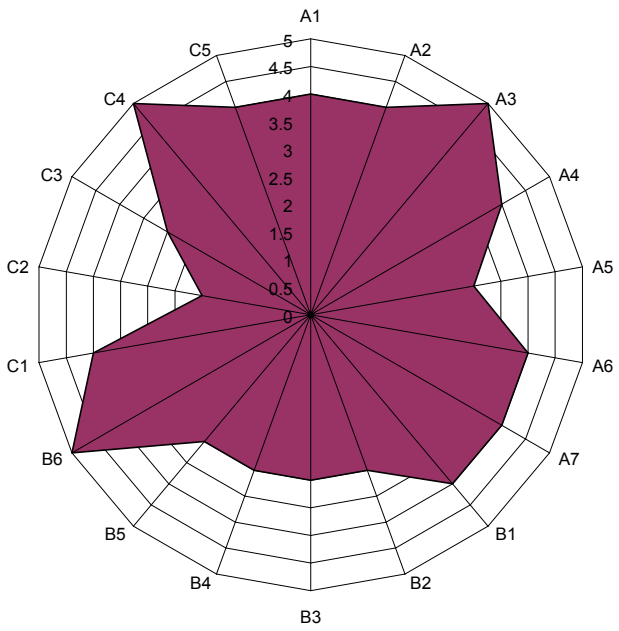


Company H

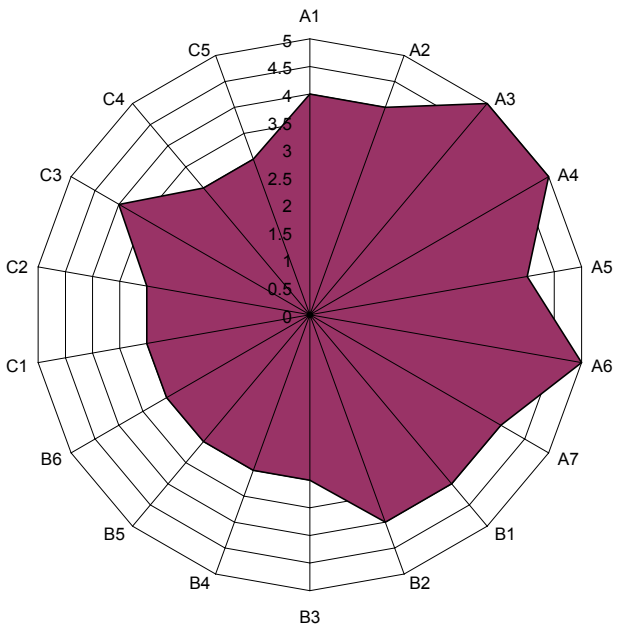


Radar Plots for Companies J to M.

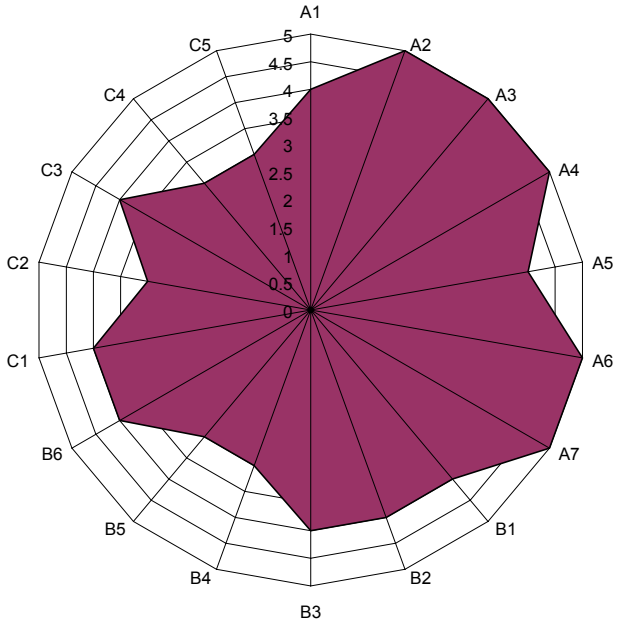
Company J



Company K



Company L



Company M