



# **Climate Change Adaptation Report – ARP4**

**December 2024**

## Contents

1. AMENDMENTS, DISTRIBUTION, REPLACEMENTS AND ENDORSEMENT .....	2
1.1. Amendments.....	2
1.2. Distribution .....	2
1.3. Replacement .....	2
1.4. Endorsement .....	2
2. BACKGROUND .....	3
2.1. Structure of Report .....	3
2.2. Southampton International Airport .....	3
2.3. Sustainability Strategy.....	3
3. CLIMATE RISK AND RESILIENCE .....	4
3.1. SIAL's Approach to Risk Management.....	4
3.2. Understanding of Climate Risks .....	5
3.2.1. Current Climate .....	6
3.2.2. Future Climate Projections.....	7
3.2.3. Future Climate Risks.....	8
3.2.4. Climate Risks and Actions .....	9
3.2.5. Potential Opportunities.....	11
3.3. Assumptions and Uncertainty.....	12
3.4. Interdependencies .....	12
4. BARRIERS.....	14
5. MONITORING AND EVALUATION PROGRESS .....	15
5.1. Embedding Climate Risks Within the Organisation.....	15

## 1. AMENDMENTS, DISTRIBUTION, REPLACEMENTS AND ENDORSEMENT

### 1.1. Amendments

Version No.	Issue Date	Comments Changes
V1.0	19.12.2022	First Copy
V2.0	31.12.2024	ARP4 review, Final Document Issued with 2024 personnel and progress revisions

### 1.2. Distribution

Controlled Master Copy: Sustainability Coordinator

General Distribution: Managing Responsibility System

### 1.3. Replacement

Replaces version 1.0 dated 19.12.2022.

### 1.4. Endorsement

Document Sponsor: Sustainability Director

Document Owner: Sustainability Coordinator

Revision Period: 1 year

Retention Period: 5 years

Date Approved: 31/12/2024.

## 2. BACKGROUND

Under the Climate Change Act 2008, section 63(5) the Secretary of State will direct certain Reporting Authorities to produce reports on the current and future predicted effects of climate change and on their proposals for adapting to climate change. The first round of reporting in 2011 focused upon major public infrastructure providers from the energy, transport, and water sectors. This was mandatory for businesses to complete.

Southampton International Airport Limited (SIAL) is owned by AGS Airports Limited which was established in 2014 to invest in Aberdeen, Glasgow, and Southampton airports. Glasgow Airport was one of the organisations involved in the mandatory reporting process in 2011. Glasgow was subsequently formally requested to complete this process in both the second and third rounds. Although not formally requested, AGS understands the potential risk of climate change to both its infrastructure and operational performance and as such, Aberdeen and Southampton airports are to complete a voluntary Climate Change Adaptation Risk Assessment (CCARA). This round of reporting is the first time Glasgow, Aberdeen, and Southampton will all be aligned as a group.

### 2.1. Structure of Report

This report follows the standard AGS Risk Assessment process in which climate change risks were identified and assessed. This starts with an understanding of the current climate in and around SIAL, followed by a study into the projected climate change impacts on the area. Risks were then identified, and key risks with actions have been highlighted. This report can be built upon and adapted with future climate prediction updates.

### 2.2. Southampton International Airport

SIAL provides an international transport hub for Hampshire and is a vital economic driver for the region, contributing more than £160 million a year to the local economy. The airport is central to supporting Hampshire's strategy of building upon its strength in marine, advanced manufacturing, further education, and tourism.

SIAL is committed to re-establishing its connectivity in order to drive wider social and economic prosperity. We recognise we must do so in a sustainable way if we are to address the climate emergency.

### 2.3. Sustainability Strategy

At SIAL we have always been acutely aware that operating such an important piece of infrastructure comes with responsibilities to our people, to our communities and to the environment. It is an undeniable fact that we must act now to reverse climate change. To do so will require partnerships across all levels of government and society and it is these partnerships that underpin the United Nations Sustainable Development Goals.

As a group (AGS), we have set ourselves the target of achieving net zero carbon for our direct emissions by the mid-2030s. These are positive and important first steps, however, we recognise our airports have a wider impact over and above our direct emissions. That is why we are committed to working with the wider aviation industry to support our sector achieve net zero carbon emissions (Scope 1 to 3) by 2045.

This purpose is underpinned by a commitment to growing sustainably. If we are to truly embed sustainability at the core of AGS, we need to set ambitious and stretching targets across all areas of the business, which demonstrate an absolute willingness to balance the clear economic and social benefits of aviation with our climate change responsibilities. It is important we make firm commitments to ensure our people view us as an employer of choice, the communities we serve can share in our success and we set out how we will grow in a responsible manner.

Our full sustainability strategy can be viewed [here](#)<sup>1</sup>. AGS is currently developing a new ESG (Environmental, Social, Governance) Strategy, which will replace the Sustainability Strategy. Once completed, this will be published on the Sustainability pages of our website.

### 3. CLIMATE RISK AND RESILIENCE

#### 3.1. SIAL's Approach to Risk Management

Risk management is about the identification, evaluation, and effective management of anticipated events that will affect the achievement of our business objectives. It is a core skill, which must be

---

<sup>1</sup> [Southampton Airport and the environment | Southampton Airport](#)

integral to every business process and to every management decision. The risks that are presented to our shareholders must be within tolerable limits and the mitigating controls must also be at a correspondingly proportionate cost. Risk management must form part of SIAL culture, with the opportunities presented being exploited and the downside treated, terminated, tolerated, or transferred.

Risk management within AGS Airports seeks to enable the identification, evaluation, and continuous management of the threats to the achievement of the individual airports' purpose, vision, objectives, and strategy. One of the intentions of this process, is to ensure closer alignments of Risk Management to Business Continuity and operational Contingency Planning requirements.

The strategy of the process for risk management is to:

- Optimise the control of risk in the context of business priorities and resource constraints.
- Meet the AGS Airports Limited Executive Committee requirements for a simplified risk register format.
- Establish a system that is reliable and consistent for risk and control assessment across the business.
- Enhance the effectiveness and efficiency across the business.
- Align risk management with the key performance areas for our core business.
- Focus risk management on actions and clear accountability.
- Reduce complexity.

## 3.2. Understanding of Climate Risks

To understand the climate risks associated with SIAL's operations, people and infrastructure, the following climate variables were analysed:

- Temperature
- Rainfall
- Snow
- Storms
- Wind

Any resulting risks were fed into the DEFRA risk register template. This was used to ensure consistency across AGS airports in reporting climate risks. A 5 x 5 risk matrix was used in analysing climatic risk, assessing the likelihood and consequence of the variable in question. A red, amber, green (RAG) status is provided as a result of the scoring (Fig. 1).

Horizons: 2025, 2050, 2080		Impact					Score
		Minimal	Minor	Moderate	Major	Catastrophic	
Likelihood	Almost Certain	5 / moderate	10 / major	15 / major	20 / severe	25 / severe	1 - 3
	Likely	4 / moderate	8 / moderate	12 / major	16 / major	20 / severe	4 - 9
	Possible	3 / minor	6 / moderate	9 / moderate	12 / major	15 / major	10 - 19
	Unlikely	2 / minor	4 / moderate	6 / moderate	8 / moderate	10 / major	20 +

	Highly Unlikely	1 / minor	2 / minor	3 / minor	4 / moderate	5 / moderate	
--	-----------------	-----------	-----------	-----------	--------------	--------------	--

Figure 1 The 5x5 matrix used when analysing the climate change risks

The methodology for understanding the climate risks was as follows:

- A baseline assessment of the current climate surrounding SIAL.
- Future climatic projections assessed to three different horizon periods, 2040-2059, 2060-2079, and 2080-2099.
- Risks to infrastructure, operations and people were identified.
- Mitigations for the risks identified.

In order to complete the above steps a workshop was carried out with departmental leads identifying risks associated with the projected climatic changes identified during the desktop study by the SIAL Sustainability Manager.

To understand future climatic changes with a relative degree of certainty, the UK Climate Projections 2018 (UKCP18) <sup>2</sup> were reviewed. This uses cutting-edge climate science to provide updated observations and projects change out to 2100 in the UK and globally.

Along with the UKCP18 projections, the EA Flood Projections were used to assess various forms of flood risk to the area. This was used in conjunction with the UKCP18 when assessing rainfall risks.

### 3.2.1. Current Climate

The climate in Southern England can be subject to continental weather influences that can bring in cold weather in winter and hot, humid weather in summer. This area of the UK is also furthest from the paths of most Atlantic depressions, which tend to bring cloud, wind, and rain – so the climate is relatively quiescent.

#### **Temperature**

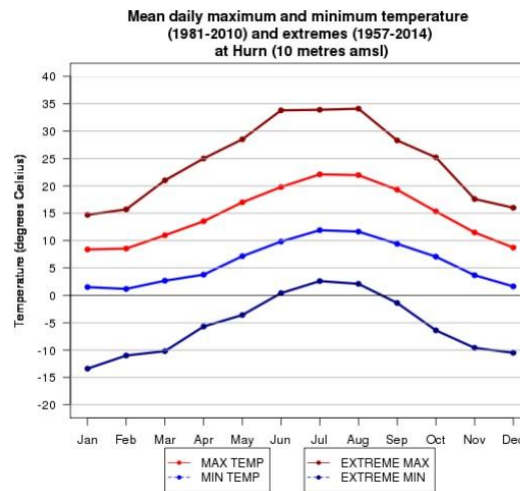
The mean annual temperatures will vary from about 11.5°C along the coast to 9.5°C over higher ground. January is the coldest month in the region with mean daily minimum temperatures of 3°C along the coast and 0.5°C on higher ground. Extreme minimum temperatures will usually occur in January and February.

July is the warmest month in the region, with mean maximum temperatures reaching 21°C over higher ground and along the coast. Extreme maximum temperatures are associated with heatwaves that last several days and will usually occur in July or August.

Coastal areas can be affected by sea breezes from late spring through the summer. This results in lower maximum temperatures than further inland. In winter this has the opposite effect, and coastal areas are generally milder than inland.

<sup>2</sup> [UKCP18-Overview-report.pdf \(metoffice.gov.uk\)](https://www.metoffice.gov.uk/publications/ukcp18-overview-report)

The variation of mean daily maximum and minimum temperatures month by month for Hurn is shown below. Hurn is a coastal village approximately 20 miles from SIAL, so will be representative of the current climate conditions experience in Southampton.

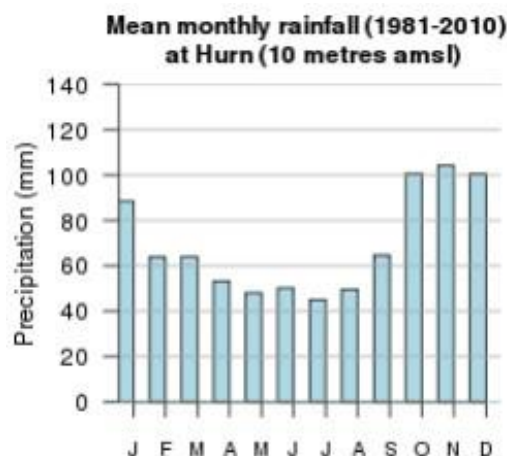


### Rainfall

Much of Southern England is relatively distant from the route of many Atlantic depressions. The wettest area in the region is the South Downs and higher parts of Dorset where there is an average of over 950mm per year. This can be compared to around 500mm in the driest parts of England, and over 4000mm in the wettest parts of Western Scottish Highlands.

Rainfall in the regions is generally well spread throughout the year. However, in Hurn there is a more pronounced rainfall in autumn and winter. Southern England is also susceptible to summer thunderstorms which bring with them high intensity rainfall – albeit short lived.

The area can also be subject to dry periods which puts a demand on water supplies. If there is below average rainfall in winter, then a dry period is likely to happen in summer.



### Wind

Southern England is one of the more sheltered parts of the UK.

### 3.2.2. Future Climate Projections



UKCP18 was used to analyse future climate situations likely to be experienced and have influence on SIAL and its operations. Various Representative Concentration Pathways (RCPs) were used to analyse the extent of change that could be experienced.

- RCP 8.5 – Business as usual – No reduction in emissions (worst case scenario)
- RCP 4.5 – Intermediate Scenario (emissions peak around 2040 and then decline)
- RCP 2.6 – Global Temperature rise is kept below 2°C. This would see carbon emissions start declining in 2020 and go to zero by 2100.
- RCP 1.9 – Would keep global temperature rise to below 1.5°C as noted in the Paris Agreement.

For this report, the high emission and low emission scenarios were reviewed with the assumption that climate change would fall somewhere in this scale.

In Southern England, by the 2080s summers are likely to be warmer by anywhere between +3°C and +8°C under the high emissions scenario. For the low emission scenario the temperature change looks to be between 0°C and +3°C. Winter follows a similar pattern, with high emission scenario having an increase of between +1°C and +5°C.

Rainfall is projected to decrease by up to 70% in a high emission scenario and decrease by 40% in a low emissions scenario over summer. Summer rain is likely to decrease, however storms will potentially increase, this can lead to extremely heavy downpours in short periods of time.

In winter rainfall levels could increase by as much as 50% in high emissions scenario and 30% in low emissions.

### 3.2.3. Future Climate Risks

A summary of the prioritised climate change risks associated with each climate variable is shown below for the short, medium, and long term at SIAL. The risks have been prioritised based on:

- The identified effects, its likelihood of occurring and its consequence on airport operations, infrastructure and/or people.
- The likelihood of critical thresholds being exceeded.
- The robustness of existing controls and measures managing the risk

A total of 25 climate risks were identified and reviewed and noted as either green (low risk), amber (medium risk) or red (high risk).

All risks have been allocated to a specific airport business unit and assigned a specific business owner responsible for managing that risk. The risks have been uploaded to the AGS risk register for SIAL.

#### Short Term (2040+)

With current mitigations in place, 22 risks were noted as green, and 3 risks noted as amber for the short term. There were no risks marked as red. The three amber risks were as follows:

Climate variable	Risk (inc. indirect and interdependency risk)
------------------	---

Temperature and rainfall	Bird migration pattern changes leading to increased risk of bird strike. Surface water flooding may encourage birds, increased risk of bird strike.
Temperature	Potential change to the distribution of pests and diseases.
Rainfall	Terminal flooding caused by increased volumes of rainfall. Block paving around the terminal is washing away and subsiding due to heavy rainfall.

#### Medium Term (2060+)

In the medium-term climate change is predicted to get worse, as a result three green risks moved to amber. One risk moved from amber to green and there are no red risks. Meaning SIAL has 20 green risks, and 5 amber risks. Changes are noted below.

Climate variable	Risk (inc. indirect and interdependency risk)
Temperature	Risk of disease and pests has decreased from amber to green following the learnings and procedures from the COVID-19 pandemic.
Storm	Increased risk of storms causing damage to assets, standing aircraft, vehicles, increased FOD and increased injuries to staff.
Storm	Increased storm events and high winds resulting in disconnection to network and voltage spikes.
Storm	Increased storm events causing schedule interruptions and decreased ATMs.

#### Long Term (2080+)

The long-term outlook shows a further worsening of climate change conditions. Out of the 25 risks, three went from green to amber meaning there are 17 green risks and 8 amber risks. The changes to risks are summarised below.

Climate variable	Risk (inc. indirect and interdependency risk)
Rainfall	Torrential rain causing surface water flooding creating hazardous conditions for aircraft and operational vehicles.
Rainfall	Drainage systems - not coping with volume of water due to increased rainfall.
Snow	Increasing freeze/thaw damage of surfaces as winter temperatures become more variable along with increased precipitation.

### 3.2.4. Climate Risks and Actions

SIAL first completed a Climate Change Adaptation Risk Assessment in 2022. To help protect Southampton Airport's infrastructure, operations, and people a list of key climate change risks and actions were identified. As part of Adaptation Reporting Period 4 these actions were reviewed, and

comments added on the progress of these (Table 1). Some risks that were identified in the workshop and covered by actions within the risk register, are still in this situation, e.g. air quality, the monitoring of this is already completed at Southampton Airport and will also address potential climate change associated risks.

**Table 1 Key climate change risks and actions, with responsible departments for managing risk indicated.**

Climate variable	Risk	Action	Responsible dept.	Update comments
Temperature and rainfall	Bird migration pattern changes leading to increased risk of bird strike. Surface water flooding may encourage birds, increased risk of bird strike.	Bird management teams to manage local bird populations and Bird Hazard Management Policy for surrounding areas.	Airside Operations	<b>Airside Operations</b> – Wildlife Hazard Management Policy in place for both on and off airfield hazard management. External ornithologist intelligence provided annually to advise of any climate-related migratory patterns to be concerned about (action completed in 2024).
Temperature	Potential change to the distribution of pests and diseases.	H&S procedures in place for bites, stings and pandemic risk. Liaison with Port Health and HPA. UK governments. Cleaning stations, testing procedure and Risk Assessment in place.	Operational Assurance	<b>Operational Assurance</b> – Risk is not a known issue at this time. Control measures are either in place or ready to be implemented should they be required.
Rainfall	Drainage systems - not coping with volume of water due to increased rainfall.	Monitoring of weather forecasts for warnings storm and rain events. Monitor surface water conditions on airfield and where needed open penstock to allow further flow of water. Spillage procedures in place to prevent pollution of water.	Asset Management/ Environment	<b>Asset Management</b> – Monitor the main drains through the BMS system, penstocks to be monitored through the BMS in 2025. <b>Environment</b> – Spillage procedures in place and detailed in a number of LOPs (Environmental Incident Response and Disposal of Trade Effluent)
Rainfall	Cabling and duct work underground being water damaged.	Regular surface inspections to ensure integrity of surface, ensure drainage system is working correctly.	Asset Management	<b>Asset Management</b> - Monitor the main drains through the BMS system, penstocks to be monitored through the BMS in 2025.

Rainfall	Terminal flooding caused by increased volumes of rainfall.	Improved drainage at front of terminal put in place. Monitor the situation when rain occurs. Action if flood occurs to stop water flowing far into terminal. Watch for storms and weather warnings to prevent initial flooding.	Asset Management/ Terminal Operations	<b>Asset Management</b> - Monitor the main drains through the BMS system, penstocks to be monitored through the BMS in 2025. <b>Terminal Operations</b> - Risk is not a known issue at this time. Control measures are either in place or ready to be implemented should they be required.
Rainfall	Surface water flooding creating hazardous conditions for aircraft and operational vehicles.	Regular inspections of runway surface. Grooved runway, drainage system, ATC procedures (increased separation distances, runway safety zones, operational guidance for pilots/airside staff). Storm Geo liaison and information shared through F24 to advise of weather events.	Airside Operations/ Asset Management	<b>Airside Operations</b> – Regular inspections of runway surface. Grooved runway, runway drainage system with recent addition to the north of the runway. Process in place for the containment of any taxiway flooding in the interceptor and penstock management system (completed in 2024). <b>Asset Management</b> - Monitor the main drains through the BMS system, penstocks to be monitored through the BMS in 2025.

### 3.2.5. Potential Opportunities

During the climate change risk assessment process opportunities were also identified. These opportunities are dependent on the extent of climate changes in the region.

Opportunity	Action
Climate becomes warmer and drier, especially over the summer period. This has potential to increase inbound tourism. This could be further enhanced as traditional holiday destinations become too hot and less desirable.	Extent of this opportunity is still unclear. This will be monitored with potential increasing summer temperatures.
Increased demand for routes to other UK destinations. Southampton is suited well to domestic travel with many routes already established across the UK. Demand for this could increase for summer holiday periods.	Extent of this opportunity is still unclear. Ongoing monitoring of demand to other UK destinations.

### 3.3. Assumptions and Uncertainty

Various assumptions and uncertainties were identified during the project. One of the biggest uncertainties is the accuracy of climate modelling – the risks and mitigations of this project were identified as a result of current climate modelling. Should the accuracy of climate modelling change, the future climate risks would need to be reviewed in line with this. There is an uncertainty on the prediction of storm events, with this being generally unknown. The main risks facing SIAL related to heavy rain and surface flooding, namely:

- Drainage systems - not coping with volume of water due to increased rainfall.
- Cabling and duct work underground being water damaged.
- Terminal flooding caused by increased volumes of rainfall.
- Surface water flooding creating hazardous conditions for aircraft and operational vehicles.

Further understanding of future storm events would aid future climate change resilience planning.

SIAL, like all businesses, acts within financial constraints. The airport must balance the need to invest in climate change mitigation measures with other business investment priorities. The uncertainty surrounding longer-term climate impacts generated via UKCP18 makes the production of a sound business case for capital investment in infrastructure and/or technology difficult to achieve.

### 3.4. Interdependencies

SIAL is acutely aware of the interdependencies there is to ensure climate change resilient infrastructure and operations.

Interdependency	Comments
Utility Supply – electricity, gas, and water.	SIAL is committed to increasing its resilience in the face of significant reliance on external utility supply. The electricity supplied to SIAL is renewable. Business Continuity Plans are in place for how SIAL would deal with the loss of utilities. However, further information is required to understand how the external parties would deal with a loss of supply. An Energy and Utilities Manager role has been added at the group level, which holds responsibility for reducing the impact of this key interdependency.
Transport Network – Southampton Airport is served by both road and rail.	SIAL is committed to improving surface access to the airport for both passengers and goods. Further investigation is required on this.
Airline and Handling Agents – without these organisations there would not be a viable business.	Ensuring our infrastructure is suitable for use by airline and handling agents is a top priority. Further investigation is required on this.

Air Traffic Control (ATC) – managing Southampton Airspace.	Reliant on ATC for the operation of Southampton Airport. Understanding the back-up options to the ATC building should services be stopped for any reason.
Environment Agency – Flood Risk Management, flood warnings and license consents.	Suitable notice of flood warnings is key to prevention. To mitigate this, StormGeo reports are monitored internally throughout the winter months where risk is highest.
UK Government – compliance with legislation, policy changes and targets.	Changes to legislation, policy and targets are monitored as they come up and SIAL prepares for upcoming regulatory changes as effectively as possible.
Local Authority – managing local developments impacting operation of business.	Proactive engagement with local authorities allows SIAL to fully understand and support key developments that may impact on its day-to-day operations. This includes the surface access network and land use changes. Further investigation is required on this.

As a member of the Airports UK Sustainability Working Group, collaboration remains a cornerstone of our approach to addressing interdependencies. SIAL is a member of the Emergency Planning Group and the Local Resilience Forum. This further strengthens our capacity to navigate interdependencies within the sector. Recognising the need for deeper research into how these interdependencies interact, we are committed to prioritising this area in the upcoming reporting period. A structured review of incidents, documentation of key learnings and systematic tracking of progress will ensure that insights are effectively integrated into our strategies for enhanced resilience and sustainability.

## 4. BARRIERS

There are barriers to climate change adaptation improvement measures, these are summarized below:

### **Environmental taxes**

The environmental tax framework is complex and ever-changing and as such creates uncertainty around any medium to long-term planning. The lack of clarity surrounding long-term funding for renewables remains a potential barrier to the implementation of potential climate change adaptation solutions.

### **Financial investment**

Securing internal investment for measures to mitigate potential long-term climate change impacts, like any other investment, requires the presentation of a robust business case; one of the key determinants will relate to the projected IRR. Uncertainty surrounding the potential fiscal returns associated with 'green investments' is a barrier to potential investment. The lack of certainty regarding some potential long-term adverse climate impacts being realised provides a weak basis for making investment decisions.

### **Regulatory constraints**

The aviation sector is subject to scrutiny with respect to its environmental impacts and specifically its contribution to climate change. The evolution of new/tighter financial controls may potentially restrict the airport's ability to invest in additional measures/infrastructure that are not integral to meeting compliance requirements.

## 5. MONITORING AND EVALUATION PROGRESS

SIAL operates an integral management system, the Managing Responsibly System (MRS). The MRS is certified to ISO 14001 (Environmental Management), ISO 22301 (Business Continuity), ISO 55001 (Asset Management) and ISO 45001 (Health and Safety Management). The MRS is a mature system which has been effective in managing the business and driving continual improvement across the business for many years.

A crucial part of the MRS is the risk register which tracks departmental risks and provides an overall view of the most significant business risks. Impacts arising from climate-related events such as flooding, storms and extreme weather are continually tracked on the system. In addition to ongoing monitoring of risks, specific actions arising from internal or external audits or those generated from internal committees are tracked via the organisations Corrective Action Required Tracker (CART). The CART is a highly effective tool for ensuring that key actions underpinning each of the areas covered by the MRS are tracked and closed out within an agreed timescale.

AGS commits to reviewing the climate adaptation report annually. This review will consist of ensuring climate data is up to date, risks are accurate and updated to reflect any advancement of climate data.

### 5.1. Embedding Climate Risks Within the Organisation

The MRS will be the tool used to ensure climate risks identified as part of this process will be included within the company risk register as noted above. Once these risks are in the risk register, they will be regularly reviewed and amended in line with the risk review process.

In addition to these measures Southampton Airport has comprehensive contingency plans in place which are regularly reviewed and tested and an integral element of SIAL's risk management function. This suite of contingency plans covers a wide range of meteorological events and other natural 'disasters' including snowfall, flooding, high winds, fog, offsite problems at destination airports, disruption to surface access and extended flight bans.

Furthermore, Southampton Airport's governance structure ensures that climate change issues are firmly on the agenda up to board level. Managers meet monthly at the Managing Responsibly Governance Group (MRGG) where significant risks and opportunities are raised, discussed and actioned. Southampton Airport also has a Health Safety Security and Sustainability Committee (HSSSC). The purpose is to provide assurance to the board regarding the adequacy and effectiveness of the companies Health, Safety, Security and Sustainability systems and their application.