Rail Delivery Group

National Rail

RDG Guidance Note: Winter Arrangements for Stations

RDG-OPS-GN-027
Issue 2 – July 2020

About this document

Explanatory Note

The Rail Delivery Group is not a regulatory body and compliance with Guidance Notes or Approved Codes of Practice is not mandatory; they reflect good practice and are advisory only. Users are recommended to evaluate the guidance against their own arrangements in a structured and systematic way, noting that parts of the guidance may not be appropriate to their operations. It is recommended that this process of evaluation and any subsequent decision to adopt (or not adopt) elements of the guidance should be documented. Compliance with any or all of the contents herein, is entirely at an organisation's own discretion.

Other Guidance Notes or Approved Codes of Practice are available on the Rail Delivery Group (RDG) website.

Executive Summary:

This Guidance Note provides advice and examples of good practice for keeping station areas free of snow and ice.

Issue Record

Issues 1 of this document was published as: GN027.

Issue	Date	Comments
1	June 2015	Original version - replaces ATOC/GPG019
2	July 2020	Update and review of the GN

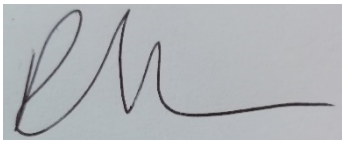
This document is reviewed on a regular 3-year cycle.

Written by / Prepared by:

Steve Roberts

Steve Roberts
Consultant, Rail Delivery Group

Authorised by:



Rob Mullen
GTR
Chair of RDG Passenger Operators' Safety Group

Contents

1 Purpose and Introduction

1.1 Purpose

This document is intended to provide guidance and advice on measures which may be taken to reduce or mitigate the hazards resulting from snow and ice build-up on and around stations - essentially the increased risk of slips, trips and falls to passengers and staff. These measures can be broadly categorised as:

i. product related;
ii. process related; and
iii. people related.

It can be focused on:

i. avoiding the risk, that is, by preventing or reducing the initial accumulation of snow and ice;
ii. removing the risk, that is, removing snow and ice either by physical means (clearance) or chemically induced melting; or
iii. reducing the risk, that is, either reducing the hazardous nature of snow and ice by rendering it less slippery, or providing additional forms of assistance to prevent slips, trips and falls.

In practice, the suitability of these various approaches will vary considerably according to individual circumstances such as weather, geography, organisation and an effective overall response is likely to include a combination of elements from each.

Overall, the aim of this document is to allow Station (i.e. Service Facility and Rail-Related Services) Operators to be better prepared to respond to future severe winter weather conditions which affect their operation.

1.2 Introduction

This Guidance Note applies to Station Operators of above ground railway stations on Network Rail managed infrastructure.

This Guidance Note assists Station Operators in addressing the risks to their operation posed by snow and ice and how these can most effectively be overcome or mitigated in areas generally intended for public use in and around stations, that is, platforms, paths, walkways, footbridges and concourses, also forecourts and station car parks to the extent that these are the responsibility of the Station Operator. Though this document does not specifically address staff walking routes, much of its content will be equally valid (it should, however, be noted that the responsibility to keep these clear and safe for use will vary).

2 Winter Weather Plans

2.1 Strategic plan

Station Operators should have in place high level winter weather plans which document the arrangements to be applied in the event of severe winter weather (below +3°C) affecting each of its stations.

These high-level station winter weather plans should include a basic assessment covering:

i. Whether or not the station is staffed.
ii. Average passenger numbers.
iii. Exposed stairways/ramps, taking into account the number of stairs and inclination/length of slope.
iv. Exposed platform surfaces in relation to passenger footfall.
v. Exposed station entrance/forecourt.
vi. The presence and size of any car park.
vii. Road access, i.e. arrangements for keeping approach roads open (in liaison with the local authority) and implications if this fails.
viii. Stations that require the use of chemical agents to clear snow and ice.

This approach should be used to identify those stations where the platform/train interface is most at risk from the effects of winter weather. It should be recognised that it is not necessarily the busiest stations that present the biggest risk as often these will have mitigating measures such as extensive platform canopies.

The strategic plans should include the contingency arrangements to be put in place to prioritise and preserve the chemical agents used on stations to clear snow and ice should supplies become restricted.

These contingency arrangements should have identified options for reducing usage along with triggers for implementation of such plans. The following are all examples of measures taken by Station Operators to reduce consumption rates:

i. Restricting treatment to those stations identified in the strategic plan as to where there is the greatest risk/benefit.
ii. Restricting treatment to those areas of an individual station where there is the greatest risk/benefit. In decreasing importance, priorities are likely to be

    a. the platform/train interface, i.e. for 1m - 1.5m from the platform edge;
    b. access routes;
    c. other operational areas;
    d. steps, footbridges and ramps;
    e. station entrances and forecourts;
    f. car parks (though depending on local circumstances there may be a need to assign these a higher priority); or
    g. where SMIS has shown claims submitted by passengers.

iii. Limiting treatment to a certain portion of the platform only (e.g. up to the 4 car stopping mark rather than the 8 car), with on train staff asked to make announcements that passengers should alight from a certain part of the train only and station announcements encouraging passengers to wait within and join the train from cleared (or canopied) portions of platforms and then walk through inside the train to find seats.
iv. Limiting treatment to certain platforms only at multi-platform stations. This may require agreement with Network Rail for line diversions to concentrate stopping services on a particular platform or platforms.
v. Cutting and maintaining paths as an alternative to treating larger areas.
vi. Ceasing to treat (and physically closing off) duplicate walking routes and entrances, e.g. a footbridge when a subway is also available.
vii. Undertaking dynamic risk assessments to determine which areas to treat and when using local staff and/or managers to monitor the situation locally, including local weather conditions and

air and ground temperatures.
viii. Station managers reporting daily with details of areas treated and untreated, usage rates and supplies on hand when temperatures reach 3ºC or lower.
ix. Using CCTV to remotely monitor local conditions.
x. Using on call managers to call in contractors when temperatures drop below a pre-set trigger.
xi. Using enhanced weather forecasting services, particularly to predict local conditions.
xii. Sending daily weather forecasts to all stations responsible for their own de-icing.
xiii. Mixing chemical agents with other, more readily available substances such as sand or grit to reduce the amount of agent needed per treatment.
xiv. Using physical clearance to supplement or replace use of chemical agents.

2.2 Station Implementation Plan

The Station Operator should develop an individual detailed station implementation plan including trigger points which should include the following:

i. The various areas of the station to be treated.
ii. The operating times of the station and when staffing for de-icing is available.
iii. The length of platform to be treated (including the arrangements for trains of a length that exceed this – for example instructing train crew to make special announcements for those alighting and/or use selective door operation).
iv. The products to be used.
v. When, how and by whom the products are to be applied.
vi. How and where products are to be stored.
vii. A site drainage plan.
viii. A simple assessment of potential impacts on the water environment.
ix. Specific arrangements for management of car parks should be explicitly addressed.
x. Risks associated with all the above and how these are to be managed.

The Station Operator should involve station staff in the development of these plans to make sure that they are practical, comprehensive and correct and to secure ‘buy in’.

Unstaffed stations present additional challenges as far as snow and ice are concerned, most obviously in that there are no staff on site to assess local conditions or give assistance to passengers to prevent or respond to slips and falls. The Station Implementation Plan for these stations should include:

i. When and how to deploy railway undertaking staff from facilities departments in the form of Mobile Maintenance Teams travelling by road.
ii. Establishing a mobile gritting team assisted by managers and deployed by road.
iii. Station servicing teams travelling by road or rail.
iv. Having contracts in place with two local suppliers to provide additional cover in severe conditions.
v. Using contractors to apply treatment in the early hours with snow clearance undertaken subsequently by Station Cleaning Teams and RPIs travelling by rail.
vi. Station adopters used to assist with snow clearance in severe conditions as well as volunteers.
vii. Using a mix of staff from the nearest staffed station, staff from relevant ‘hub’ station, mobile estates managed teams and management volunteers under ‘adopt a station’ scheme.

It should be noted that many of the above measures rely on road transport to reach stations and an additional problem here is that unmanned stations are often in remote locations where approach roads are unlikely to be among those prioritised for treatment by local authorities. As such, access may be difficult or impossible, both for customers and for those (whether staff or contractors) endeavouring to undertake snow clearance.

RSSB research project T983 found that some unstaffed stations were not treated at the time of an incident as the de-icing team was en-route to carry out that duty. This type of incident may be avoided if the de-icer is in place prior to the freezing event to prevent ice formation. However, this requires reliable weather forecast information, and there were several incidents reported where de-icing had not been undertaken as frost was not forecast at the time of the decision.

Passengers should be made aware of stations at which snow and ice clearance is likely to be problematic by means of posters (both at the stations concerned and others on the same line or route)

and/or on station and on train public address announcements and asked to take particular care.

As part of its planning and preparation, the Station Operator is recommended to undertake the following:

i. Prior to the onset of winter, an assessment of equipment requirements (or a previous assessment reviewed), i.e. what and how much is needed and where. This should also include stocks of associated consumable items (including PPE and warm and winter weather clothing).
ii. Checks should then be made to ensure that these requirements are being met, with damaged or broken equipment repaired or replaced.

Following a period of winter weather, it is recommended that Station Operator's undertake the following equipment check:

i. All equipment used should be inspected, with any that is damaged or worn out either repaired or replaced.
ii. All equipment should be cleaned, oiled, and given maintenance as appropriate prior to being put into storage for future use.
iii. An inventory of all equipment should be undertaken.
iv. Feedback from staff on the availability and effectiveness of equipment should be sought and adjustments to future requirements (amount and type of equipment) made accordingly.
v. Equipment should then be stored for future use, ideally in a dry, secure environment to minimise rusting, general deterioration, etc.

Arrangements for clearance of snow and ice from stations should be subject to risk assessment and safe methods of working (which may be generic or station-specific) identified and documented for these activities. Ideally these methods should be produced as localised plans incorporated within the station's contingency plans. Where they are generic, attention should be drawn to the need to consider local risk factors.

Risk assessments and safe methods of work should consider, as a minimum:

i. Appropriate briefing of all those engaged in snow and ice clearance, including on all identified risks and how they should be avoided or mitigated, prior to commencing work.
ii. Use of staff, contractors and/or volunteers referenced in section 6.2 who may be unfamiliar with the location and/or normally employed on other duties.
iii. The method of moving snow, the tools/equipment to be used and the extent to which this will bring staff into proximity to the platform edge.
iv. Physical capability of individuals to undertake the work.
v. Manual handling risks associated with the clearance of significant amounts of snow.
vi. Competence to use any mechanised equipment, including training where appropriate.
vii. Underfoot conditions.
viii. Requirements for provision of clothing, footwear and PPE, both for protection against the prevailing weather conditions and in line with the manufacturer's instructions if chemical products are being used.
ix. Provision of adequate breaks and welfare facilities, considering additional stresses from working in extreme cold conditions.
x. Whether Network Rail permits snow to be cleared onto the track.
xi. Potential presence of conductor rail or overhead line equipment and risks of any inadvertent contact with this equipment.
xii. The potential risks of being struck by a train. Factors influencing the chance of being hit by trains, include:

    a. the frequency, speed and direction of train services;
    b. the likelihood of non-stopping trains passing through the platform (including as a result of service disruptions);
    c. the presence of bi-directional working;
    d. the proximity to junctions and the routeing of trains;
    e. the visibility of approaching trains, considering whether this might be affected by sharp platform curvature, bridges/tunnels, the presence of other trains, weather conditions, darkness or the wearing of bulky clothing;

f. the audibility of approaching trains and the ability to hear warnings (e.g. impact of headwear, station announcements);
g. the frequency of looking up for approaching trains; and
h. how visible workers are to drivers of trains – those engaged in platform snow and ice clearance should wear high visibility clothing.

xiii. The need at high risk locations for special arrangements such as the provision of an additional person to warn of the approach of trains or the closure of the adjacent line.

In general, snow clearance from platforms is not considered to be engineering or technical activity and hence can be carried out closer than 1.25m from the platform edge without being "on or near the line". However, the system of work should specifically consider any risks for train movements and seek to reduce them so far as is reasonably practicable.

2.3 Engagement with local authorities

Local authorities are generally responsible for roads and pavements (the exceptions being the motorway and trunk road networks for which the Highways Agency is responsible) and this includes snow and ice arrangements.

Maintaining safe road access to stations is key to customers and staff. In many cases, particularly on secondary and branch lines, road may provide the only access for those deployed to undertake snow and ice clearance, either because train services have themselves been suspended or because services are not scheduled to run at the times when treatment is most required (e.g. overnight or prior to the commencement of services).

Local authorities will develop their own plans for prioritising the treatment of the roads for which they are responsible. As many stations are not served directly by main routes it follows that station approaches will not automatically be recognised by local authorities as being of high priority (the same issue applies to approach roads to maintenance depots where loss of road access may adversely affect delivery of essential engineering supplies and fuel).

Station Operators should seek to engage with local authorities during the development of the latter's winter weather response plans with a view to getting local authority agreement that station approaches should, where appropriate, be included among the roads identified as being a high priority for treatment.

2.4 Communication of plans

Plans should be deliverable, made available to and must be understandable by all relevant staff.

2.5 Review and Future Planning

Both the Strategic and Station Implementation Plans should be reviewed following any instances of severe winter weather to confirm that they are fit for purpose. Such reviews should explicitly consider processes, materials, equipment and staffing/resourcing issues and should involve local staff. Plans should be updated to reflect any lessons learned with consideration also given to whether local lessons learned have application beyond the location concerned.

3 Snow and Ice Clearance

3.1 Risk

The primary risk posed by snow and ice accumulations is the simple one of walking surfaces being rendered slippery. A secondary risk is that a covering of snow may disguise existing slip and trip hazards such as steps and uneven surfaces. In both cases the immediate consequence is an increased likelihood of slip, trip and fall type accidents, for both the public and staff. While the majority of these are likely to be of a minor nature, there is also a propensity for more serious injuries, such as broken limbs, with the additional risk that a fall close to a platform edge could result in the victim falling onto the track with potentially fatal consequences. It is also possible for snow and ice to be transferred by passengers onto the steps and into the doorways of trains from the platform.

From a financial perspective, the Station Operator may find itself facing an increased number of claims for compensation, the likelihood of success of which will be dependent on the Station Operator's ability to demonstrate that it has taken all reasonable steps to manage the risk, given the circumstances. Injuries to staff may also result in claims being made but will have a more immediate impact in terms of lost days. Finally, the ORR has indicated that it may direct the Station Operator to close a station if it determines there is an unacceptable risk to the public due to the presence of snow and/or ice.

3.2 Prevention and physical removal of snow and ice

The optimum solution is to prevent the build-up/formation of snow and ice in the first place. Though in the short-term there are likely to be few, if any, practical steps to achieve this beyond application of de-icing agents as a preventative measure.

Physical removal of ice and snow by manual/mechanical means, should always be considered as an effective and relatively simple response. Depending on the availability of manpower resources it can also be achieved at no or minimum cost as no specialist skills or equipment are needed.

Visible progress of snow/ice clearance acts as an incentive and has been seen to increase productivity. As such larger teams are likely to be disproportionately more effective than smaller teams and a minimum team size of four is therefore recommended.

If only shovels or similar are being used, then no specific skill or specialist training is required. The non-specialist nature of the activity means it is possible to draft in additional manpower to assist from a wide variety of different sources. Examples, many of which have already been successfully deployed by railway undertakings, include:

i. From elsewhere within the railway undertaking:

   a. booking office staff[1];
   b. cleaning staff;
   c. Revenue Protection Inspectors (RPIs);
   d. train crew;
   e. management staff;
   f. HQ staff; and
   g. Customer Action Teams (CATs).

ii. From elsewhere within the rail industry:

   a. staff from other railway undertakings unable to reach their normal place of work and hence 'reporting for duty' at their local station (or elsewhere);
   b. permanent way gangs (found to be especially beneficial as they tend to have both the equipment and physical stamina to be particularly effective); and
   c. HQ staff.

[1] N.B. if it decided to suspend booking office duties in favour of snow and ice clearance, traincrew should be informed accordingly and instructed to sell a full range of tickets

iii. From outside the rail industry:

a. Contractor staff;
b. local authority staff;
c. volunteers from the local community (including 'station friends');
d. remand prisoners;
e. probation service; or
f. farmers.

Station Operators should brief staff undertaking snow clearance duties as to any risk that they may face whilst carrying out such activities.

Snow and ice clearance using only manual tools is a relatively risk-free activity and hence there should be no need for additional specific requirements. The most obvious areas of concern will be when clearing platform edges and other areas where train movements may pose a risk and there is hence a need to properly brief and manage/supervise individuals undertaking unfamiliar manual tasks.

Station Operators should supply adequate equipment for snow clearing duties, this should include:

i. Simple shovels or snow pushers for use on stations, particularly on platform edges.
ii. Robust, metal shovels – experience with use of cheaper/plastic shovels has shown these to rapidly disintegrate if used on compacted snow and ice but will need to have wood plastic or GRP shafts/handles.
iii. Specialist equipment of the sort used by local authorities for general road clearance for larger areas and car parks as shovels will be less effective. Where procurement of such equipment cannot be justified, options for hiring it in should be considered (taking into account the need for staff to be competent in its use).

With the quality and amount of snow clearing equipment having been much improved in recent years there is a big difference in the type of equipment required based on the surface and how compacted the snow is as well as the physical amount of it.

Consideration should be given to the disposal of snow and ice that is physically removed, taking into account the following:

i. In many cases it will be sufficient to pile snow alongside the area being cleared, though care should be taken that any temporary thawing of such piles does not result in run off onto cleared areas that subsequently refreezes.
ii. Limited clearance may mean that such nearby piling of snow and ice may not be possible – this is most obviously the case for platform edges (where the area further back from the edge also needs to be kept reasonably clear to provide a safe zone in which passengers can stand well clear of non-stopping trains).
iii. Network Rail has reached agreement with (at least) one Station Operator that snow may be disposed of onto the track, subject to the following:

a. only snow cleared from the immediate platform edge, i.e. in the area between the yellow line and the platform edge, may be so disposed of;
b. snow must not be disposed of onto the third rail; and
c. a safe method of working must be adopted, including specific requirements in respect of being able to sight oncoming trains.

When ice and particularly snow has been cleared, a follow up check should be made to ensure that no thin coating of ice remains, not least as this may be more slippery and present a greater hazard than the material removed for example snow.

4 Use of Chemical Agents to Clear Snow and Ice

4.1 Comparison with physical clearance

Use of de-icing agents in connection with snow and ice offers several advantages over simple physical clearance:

i. It can be used as a precautionary measure to inhibit the initial formation of ice and build-up of snow. Precautionary treatment requires less material than a reactive treatment and can prevent incidents associated with treating frozen surfaces. However, to carry out precautionary treatment in a timely manner does require reliable weather forecast information.
ii. Effects are longer lasting than is the case for physical removal (which offers no mitigation to subsequent snow/ice beyond serving to reduce total accumulations).
iii. It is generally less labour intensive to apply than physical removal of snow.

Conversely, and depending on the product used:

i. There may be a significant cost.
ii. There may be a requirement to comply with specific storage arrangements.
iii. There may be a requirement for specific Personal Protective Equipment (PPE).
iv. To be most effective, products need to be applied in accordance with manufacturer's instructions, hence staff need to be trained in and familiar with their use.
v. Unlike physical removal of snow, the effectiveness of the product is not immediately and visually apparent, leading to a temptation to over-apply.

The manufacturer's instructions for use of de-icing products should always be strictly followed. Over-application is financially wasteful, increases potential damage to the environment and may present a safety hazard to both the public and staff. Appropriate investment should be made in provision of suitable equipment and in the training of staff in its correct use. It should be noted that poorly timed or under-application may result in worse conditions than not applying at all. Refreezing can give a smooth slippery surface ice rather than loose snow for example.

4.2 Types of chemical agent

Historically, extensive and effective use has been made of rock salt (sodium chloride) to combat snow and ice both within the rail industry and more widely. However, the corrosive properties of rock salt, affecting both concrete and iron-based metals (though much less copper), have long been recognised. These are a concern regarding signalling systems, including track circuits, however, RSSB research concluded that although it is known that the presence of salt is likely to cause track circuits to fail, it is a particular problem in coastal areas affected by seawater spray. No direct evidence has been found to show that salt spread on station platforms has ever had a similar effect.

In recent years a variety of other products have appeared in the market, all generally seeking to deliver an equivalent (or greater) effectiveness to that of rock salt in inhibiting ice formation and melting existing snow and ice but without comparable undesirable side effects.

Existing de-icing agents may be categorised as follows based on their chemical composition:

Chloride based	Sodium chloride (NaCl), magnesium chloride (MgCl2) and calcium chloride (CaCl2). These de-icers can also be mixed with corrosion inhibitors.
Acetate based	Calcium magnesium acetate, potassium acetate and sodium acetate.
Formate based	Potassium formate and sodium formate.
Urea based	Urea (also called carbamide).
Glycol based	Ethylene glycol, propylene glycol, diethylene glycol.

Many products are available in a variety of physical forms. The most basic division is between liquid and solid, with various subdivisions of the latter (e.g. granular, crystal, etc.). The form in which the product is supplied and/or applied will influence its effectiveness in terms of penetration, speed of action, longevity of effectiveness, susceptibility to dispersion (e.g. by wind or rain), etc.

Other factors which may influence the preferred form include the availability and security of storage facilities, the availability of the equipment needed and the availability of competent staff.

4.3 Effectiveness of different chemical agents – practical experience

The nature, longevity and wide geographical spread of the severe weather during winter 2009-10 in particular, provided a unique collective opportunity to compare the overall effectiveness of a considerable range of different products in use across the country.

Feedback from Station Operators from this was both consistent and robust:

i. A consensus that rock salt is effective.
ii. A general consensus that non-sodium chloride-based products were insufficiently effective.
iii. A mixed view concerning the effectiveness of sodium-chloride based products beyond rock salt itself.

4.4 Use of rock salt

As previously stated, rock salt is cheap, easy to apply and effective as a de-icing agent but does have undesirable corrosive properties.

One option, adopted by at least one railway undertaking, is to put in place a process whereby on call managers can authorise use of salt if conditions become so bad that nothing else proves effective.

Please refer to the risk assessment framework set out in Appendix A for further information on where to use salt.

Alternatives could be considered including grit and cinders.

4.5 Areas requiring treatment and key concerns

Areas requiring treatment and their key concerns are as follows:

Treatment Area	Key Concerns and Considerations
Platform areas	i. Passenger safety. ii. Minimisation of the risk of damage to track and signalling equipment as a result of the corrosive properties of any product used. iii. Potential damage to train floors/fittings. iv. Turbulence from passing trains.
Station areas other than platforms (e.g. forecourts, concourses, waiting areas, footbridges, etc.)	i. Presence of significant amounts of metal infrastructure means that corrosion is still an important consideration. ii. Slip/skid resistance. iii. Away from track, electrical conductivity is less relevant. iv. Away from track, adhesive qualities are less relevant.
Car Parks	i. Typically, large areas well away from tracks and other infrastructure, cost and ease/speed of application becomes a prime consideration.

4.6 Site drainage

Most de-icing agents have the potential to cause environmental damage, particularly if they are either stored or used inappropriately or in contravention of manufacturer's instructions.

A clear understanding of the site drainage is a pre-requisite for good site management and appreciation of the potential impacts of the use of de-icing products. The Environmental Agency have made it known that they will be increasingly challenging owners of sites of all kinds to demonstrate that they understand their drainage.

4.7 Supply and demand

Chemical agents – and rock salt in particular – are used widely by local authorities and other transport operators/modes in connection with snow and ice clearance and experience has shown that in the event of prolonged and widespread severe weather demand is liable to outstrip supply at a national level.

4.8 Salt Cell

In January 2010 the Government set up a Salt Cell. Convened by the Department for Transport and including representation from the Cabinet Office, the Local Government Association, the Highways Agency and the devolved administrations in Scotland and Wales, its purpose was to assess which areas of the country needed salt the most, make recommendations to suppliers accordingly on how to prioritise their deliveries and generally facilitate mutual aid agreements. In practice, it was apparent that initially no consideration whatsoever was given to rail industry needs, priority being given exclusively to roads. This had the effect that a number of Station Operators found that their suppliers were no longer able to honour what had been regarded as 'guaranteed supplies', having been obliged by the Salt Cell to redirect them elsewhere.

Though high level representation by ATOC (now RDG) to the DfT had some effect in getting rail industry requirements at least acknowledged within the Salt Cell, all indications are that road transport will continue to be seen as a higher priority should a national (or regional) Salt Cell again be set up in response to severe winter weather.

4.9 Other supply problems

In addition to the problems presented by the general shortage of supplies and activities of the Government Salt Cell as referred to above, the following difficulties in obtaining supplies have also been reported:

i. Contractors were unable to deliver because of being snowed in themselves, or because road access to delivery points was blocked.
ii. Broken promises on the part of contractors.
iii. Failure of contractors to manage/supervise their own staff (where snow/ice clearance is contracted out).

4.10 Resilience of supplies

To reduce the likelihood and/or impact of the above, the following should be considered:

i. Not relying on a single supplier - having contracts in place with different suppliers, particularly if in different geographical areas, provides flexibility in sourcing supplies.
ii. Making efforts to build positive relationships with suppliers.
iii. Setting up regional stockpiles so as to provide a degree of resilience in the event that supplies from contracted suppliers are interrupted or delayed.
iv. Putting in place an early warning mechanism to highlight any potential future supply problems in order that measures to preserve existing supplies can be taken at the earliest opportunity – see Section 7.9 below.

4.11 Equipment and storage

For general considerations concerning supply and management of equipment the following apply specifically with regard to chemical agents:

i. Chemical agents may be delivered in either solid or liquid form.
ii. Storage of chemical agents should be as per any instructions provided by the manufacturer/supplier.
iii. Application of chemical agents should be as per any instructions provided by the manufacturer/supplier, including use of any specified spreading/spraying equipment.
iv. Protective clothing may be required – again manufacturer/supplier instructions should be followed.

The availability, nature and security of storage facilities need to be taken into account, particularly in respect of the potential environmental impact. Specific products will generally have recommended instructions for safe storage.

All de-icing products should be stored under cover/in containers and on an impermeable surface to avoid any washing of the material into surface water drains or into the ground. There should be no public access to areas used for storage.

4.12 Resources

As application of chemical agents is generally less labour intensive than physical clearance of snow and ice, manpower requirements will be proportionately lower. However, the ability to call on additional staff will still be helpful in that it can allow more rapid treatment, more frequent treatment or provide cover in the event that rostered staff are unable to reach their normal place of work. The content of Section 3.2 therefore remains relevant to use of chemical agents. Staff should be generally available to repeat applications of the product at the necessary frequency needed to ensure continued effectiveness.

4.13 Training and Competence

In all cases where chemical agents (including rock salt) are being used training of those involved is needed in order that the product is applied as efficiently and effectively as possible. Clearly application of too little of the product or insufficiently frequent application will reduce effectiveness, conversely over liberal/frequent use will be wasteful. The natural inclination to expect an immediate visible effect may well serve to encourage over-application.

In the report as part of RSSB research project T981 a survey of Station Operators was undertaken. The survey results indicate that there was a lack of understanding regarding spread rates. This may be a function of the wrong person filling out the form, or there may be a need to educate staff on the importance of the right amount of treatment at the right time. This is important as excess material can be wasteful and detrimental to floor surfaces and cause corrosion.

In addition, specific competence may be required in any or all handling, preparation and application of the product, including in the use of any associated equipment. Prior to the onset of winter, the following tasks should therefore be undertaken:

i. Existing competence requirements should be reviewed to ensure that they remain appropriate. This should consider:

   a. for existing products: any changes in manufacturer/supplier instructions and recommendations; any changes in equipment to be used; any changes about where the product is to be used; and
   b. for new products: requirements in respect of storage, manual handling and application.

ii. Checks should be made to ensure that staff whose normal duties include snow clearance have (or retain) the necessary competence, with training provided as necessary.

Additional staff (or other individuals) drafted in at short notice to assist with snow and ice clearance must similarly be competent. Whether or not it is practical for this competence to be gained at short notice will be dependent on circumstances (e.g. how much training is required, whether an appropriate person is available to provide it, the existing knowledge/experience of the individual, etc.).

5 Other Measures for Mitigating Snow and Ice

5.1 Reducing slipperiness of surfaces

Where it is not possible to remove or treat snow and ice it may be possible to apply one or more of the following measures to improve the skid resistance of surfaces and hence lower the risks of slips and falls:

i. Applying sand – sand routinely used in locomotive/traction unit sanding equipment has been found to be effective.
ii. Providing temporary surfaces (such as mats, strips of AstroTurf or equivalent, etc.) may be beneficial as how slippery ice and particularly snow are is dependent on the surface on which they form/fall.

5.2 Other mitigation measures

Even with the most efficient arrangements in place to clear snow and ice, it is inevitable that extreme winter weather conditions - most obviously falling snow - are likely to increase the risk of slips, trips and falls. It is therefore appropriate to put in place mitigation measures additional and complementary to those targeted on clearance. These basically take two forms; those intended to warn and thus encourage greater vigilance among passengers and those comprising additional physical aids.

Warning and informing measures include:

i. Providing posters on stations and in car parks warning of the need to take extra care given the conditions.
ii. Giving similar warnings by means of Public Address announcements on trains and at stations.
iii. Using on train and on station Customer Information screens and systems for the same purpose.

Physical aids include:

i. Provision of additional staff at stations to assist those who are particularly vulnerable (e.g. persons with reduced mobility, blind/partially sighted persons, those with heavy luggage, those with young children, etc.) and also to respond promptly to anyone who does suffer a fall.
ii. Providing additional temporary handrails and/or grab poles.
iii. Providing additional lighting.
iv. Signposting cleared walking routes.
v. Physically closing off untreated routes and areas.

6 Suggested Long-Term Measures

The following have been identified as measures which might be implemented in the longer term to provide an enhanced response to severe winter weather, particularly with regard to preventing accumulations. As far as is known, no detailed assessment of their practicality or cost effectiveness has yet been undertaken.

i. Provision/extension of canopies.
ii. Provision of temporary or pull out canopies (of the type used by some shops).
iii. Provision of heated platform surfaces – wiring could be incorporated as part of the design of coping stones or areas adjacent to them, especially for new build or refurbishment.
iv. Use of surfaces naturally resistant/retardant to the build-up of snow and ice.
v. Use of surface coatings and/or colouring that may inhibit the build-up of snow and ice.
vi. Use of softer surfaces such as AstroTurf or similar on paths from e.g. car parks. Such surfaces – which can be distinctively coloured to support differentiation of routeing – also much reduce the chance of injury if a person does slip/fall.
vii. Provision of air blowers to prevent frost formation and disperse accumulations, would probably need to be at air temperature (blowing warm air might melt snow only for the resulting water to then refreeze as solid ice).
viii. To understand the nature of the hazard and the options developed by other industries.

7 Further Reading

Evaluation of Frost, Ice and Snow Precautions at Stations, Project T532	Rail Safety and Standards Board (2005)
Use of rock salt for de-icing of platforms and station surfaces	Rail Safety and Standards Board (2013)

Appendix A – Risk Assessment Framework

Station name: Decision maker name:			Station category: A Date:			
Component Identify component material and condition from the drop down menu	Material	Hazards and Associated Risks	Impact of salt use			Control measures
			Likelihood	Severity	Risk Rating	
Platform	Metal deck on metal struts / Surfacing Pristine	Steel corrosion Platform collapse causing serious injury or fatality	Medium	Very High	High Risk	Do not use salt
Footbridge	Coated steel / Poor	Steel corrosion Footbridge collapse causing serious injury or fatality	Very High	Very High	High Risk	Do not use salt
Canopy	Coated steel / Good	Steel corrosion Canopy collapse causing serious injury or fatality	Medium	Very High	High Risk	Do not use salt
Lamp/CCTV post	Coated steel / Good	Steel corrosion Post collapse causing serious injury or fatality	Medium	Very High	High Risk	Do not use salt
Seating	Coated steel / Good	Steel corrosion Seat collapse causing injury	Medium	Medium	Moderate Risk	Salt to be used with caution: asset to be washed down and maintained regularly
Bins	None	None	None	None	No Risk	Salt may be used but not adjacent to vulnerable assets
Cycle racks	Aluminium / Pristine	Metal corrosion Rack collapse causing minor injury	Very Low	Low	Low Risk	Salt may be used but not adjacent to vulnerable assets
Barriers / Railings	Coated steel / Pristine	Steel corrosion Barrier collapse causing minor injury	Low	Medium	Low Risk	Salt may be used but not adjacent to vulnerable assets
Track circuit	No track circuit	None	None	None	No Risk	Salt may be used but not adjacent to vulnerable assets

Guidance Notes
Hazard and associated risks: an unsafe situation, act or omission with the potential to cause harm. Associated risk: the chance of harm arising from the hazard. Risk rating: product of (i) likelihood of harm arising and (ii) the severity of the outcome. On this form risk is rated as high, moderate or low.
Impact of salt use evaluation: Both 'likelihood' and 'severity' have been assessed for each component based on the composition and condition, without control measures in place to provide and initial risk rating.
Control measures: Where possible, hazards should be eliminated. Where this is not possible and hazards remain, control measures must be implemented that reduce 'likelihood', 'severity' or both in order to minimise the risks to health and safety.
Distribution: This assessment must be issued / communicated to all persons responsible for de-icing at this station.

Rail Delivery Group

National Rail

Rail Delivery Group Limited Registered Office, 2nd Floor, 200 Aldersgate Street, London EC1A 4HD
www.raildeliverygroup.com 020 7841 8000 Registered in England and Wales No. 08176197