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Fi2021/02693**Ministry of Finance**Swedish Accident Investigation Authority
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INVESTIGATION AUTHORITY

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This document is a translation made by SHK of the original response in Swedish to the safety recommendation. In case of discrepancies between this translation and the Swedish original text, the Swedish text shall prevail in the interpretation of the response.

Statement in view of the Swedish Accident Investigation Authority's final report concerning the collapse of the roof of Tarfalahallen in Kiruna on 7 March 2020**The case**

In a final report concerning the collapse of the roof of Tarfalahallen in Kiruna on 7 March 2020 (RO 2021:01), the Swedish Accident Investigation Authority (SHK) has issued one recommendation to the Swedish Government. In a letter of 29 July 2021, SHK has also explained that it is awaiting a response about what action has been taken as a consequence of the recommendation.

General information about the Government's work on the quality of construction

It is important that buildings have good safety. In December 2017, the Government tasked the National Board of Housing, Building and Planning with enhancing work to promote a good indoor environment (N2017/07419/BB). This work includes identifying and investigating systemic faults within construction and widespread damage to the building stock. A report on this assignment is to be published no later than 31 December 2021.

In June 2019, the Government tasked the National Board of Housing, Building and Planning with reviewing the National Board of Housing, Building and Planning's construction rules (2011:6) – regulations and general advice and the National Board of Housing, Building and Planning's regulations and general advice (2011:10) on the application of European construction standards (Fi2019/02343). The aim of this review is to create a simplified and consistent regulatory framework with, as far as is possible, a structure and level of detail that is similar throughout. In December 2020, the National Board of Housing, Building and Planning issued the report The construction rules of possibilities – a new model for the National Board of Housing, Building and Planning's building and construction rules (report 2021:31). The National Board of Housing, Building and Planning has submitted the report and is working to a schedule under which various parts of the regulatory framework enter into force up to and including 1 July 2024.

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The Swedish Accident Investigation Authority's recommendation and the Government's new assignment

In its report concerning the collapse of the roof of Tarfalahallen, SHK has issued one recommendation to the Government to initiate necessary changes in the planning and building legislation for the purpose of achieving and maintaining sufficient safety with respect to the load-bearing capacity of buildings. According to SHK, the safety of buildings with structural parts corresponding to safety class 3 in accordance with BFS 2019:1 (ECS 11) should be improved through the introduction of the following requirements.

- A requirement for dimensioning inspection by an independent party, the expertise of which is verified through, for example, accreditation or certification.
- A requirement for inspection of the building by an independent party before final confirmation is provided. The inspection shall verify that the building has been built in accordance with the construction plans.
- A requirement for recurrent inspections and maintenance measures in order to ensure that load-bearing capacity is maintained throughout the life of the entire building. These requirements should also encompass existing buildings. It shall be possible to report the inspection results and maintenance measures to the supervisory authority.

Construction is a complex process in which a large number of participants and interests are concerned. The Government has been working for a long time on both improving the quality of construction and simplifying rules and streamlining when it comes to the urban planning process.

A more in-depth and broader evidence base is required in order to adopt a position on the action proposed by SHK in its recommendation. Consequently, the Government has, on 7 October 2021, tasked the National Board of Housing, Building and Planning with investigating certain matters as a consequence of the collapse of the roof of Tarfalahallen (Fi2021/03285, see *appendix*). The board shall, among other things, analyse the economic impact of the action proposed by SHK. The National Board of Housing, Building and Planning shall submit a report on this assignment to the Government Offices of Sweden (Ministry of Finance) no later than 21 January 2022. The matter of changes to the regulatory framework will then be investigated further within the Government Offices.

[signature]

Magnus Bengtson

Head of Administration and Legal Affairs

07/10/2021
F12021/02693 (partially)
Fi2021/03285

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Planning

National Board of Housing, Building and

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Assignment as a consequence of the collapse of the roof of Tarfalahallen, Kiruna Municipality

The Government's decision

The Government tasks the National Board of Housing, Building and Planning with investigating certain matters as a consequence of the collapse of the roof of Tarfalahallen in Kiruna Municipality.

The board shall, among other things, analyse the economic impact of the action proposed by the Swedish Accident Investigation Authority (SHK) as a consequence of the roof collapse.

The National Board of Housing, Building and Planning shall submit a report on this assignment to the Government Offices of Sweden (Ministry of Finance) no later than 21 January 2022.

The National Board of Housing, Building and Planning may use a maximum of SEK 750,000 on this assignment in 2021, which shall be accounted for against expenditure area 18 Land use planning, housing provision, construction and consumer policy conducted appropriation 1:4 National Board of Housing, Building and Planning, appropriation item 3 For national work within housing and the field of land use planning and construction. The funds are being paid out following requisition addressed to the Legal, Financial and Administrative Services Agency no later than 1 December 2021.

Accounting for the funds used and repayment of unused funds shall take place to the Legal, Financial and Administrative Services Agency no later than 21 March 2022 with reference to this decision.

Background

The roof of Kiruna's sports hall Tarfalahallen collapsed in March 2020. Around half of the building collapsed. At the time of the collapse there were two people in the hall but no one was injured.

SHK, which is tasked with investigating accidents for the purpose of improving safety, issued its final report into the collapse of the roof of Tarfalahallen (RO 2021:01) in July 2021. It was established in this report that the load-bearing roof structure in the hall consisted of sub-tensioned glulam roof trusses with a span of 54 metres and a trapezoidal metal plate. According to SHK, the cause of the accident was that the stabilising secondary structures had not been calculated and dimensioned correctly. A contributory cause was also that the roof structure had not been assembled correctly and that a modification had taken place of the original design. The fact that this had not been detected was due to the inspection plan having a generalised format, which led to insufficient inspection of the assembly procedure and of how the building was constructed.

During the ongoing investigation, SHK sent a report to the building committees of Sweden's municipalities concerning the risks of this type of roof structure. This was done because there was a fear that the stability failings might be present in other similar roof structures. The responses received showed that deficiencies in dimensioning and execution of roof structures were common and thus not confined to Tarfalahallen.

In its report, SHK has stated that action needs to be taken in order to prevent buildings collapsing due to insufficient load-bearing capacity. According to SHK, the safety of buildings with structural parts corresponding to safety class 3 in accordance with the National Board of Housing, Building and Planning's regulations and general advice (2011:10) on the application of European construction standards should be improved through the introduction of the following requirements:

- A requirement for dimensioning inspection by an independent party, the expertise of which is verified through, for example, accreditation or certification.
- A requirement for inspection of the building by an independent party before final confirmation is provided. The inspection shall verify that the building has been built in accordance with the construction plans.
- A requirement for recurrent inspections and maintenance measures in order to ensure that load-bearing capacity is maintained throughout the life of the entire building. These requirements should also encompass existing buildings. It shall be possible to report the inspection results and maintenance measures to the supervisory authority.

In its report, SHK has recommended that the Government initiate necessary changes in the planning and building legislation for the purpose of achieving and maintaining sufficient safety with respect to the load-bearing capacity of buildings.

SHK's report also contains a comparison with the inspection systems for construction projects in Norway, Denmark, Finland and Germany. For the Nordic countries there is also a description of what inspections would have applied for Tarfalhallen, had these inspection systems been applicable. However, SHK's report does not contain a comparison with our neighbouring countries' systems for recurring inspections of the load-bearing capacity of existing constructions.

SHK's report also indicates that Lund University believes that an advanced academic investigation of, among other things, the effects of independent examination of construction quality is of high priority.

In June 2019, the Government tasked the National Board of Housing, Building and Planning with reviewing the National Board of Housing, Building and Planning's construction rules (2011:6) – regulations and general advice and the National Board of Housing, Building and Planning's regulations and general advice on the application of European construction standards (Fi2019/02343). The aim of this review is to create a simplified and consistent regulatory framework, with, as far as is possible, a structure and level of detail that is similar throughout. In December 2020, the National Board of Housing, Building and Planning issued the report The construction rules of possibilities – a new model for the National Board of Housing, Building and Planning's building and construction rules (report 2021:31). The National Board of Housing, Building and Planning has submitted the report and is working to a schedule under which the new rules enter into force up to and including 1 July 2024.

As part of the Government's work to improve the quality of construction, the National Board of Housing, Building and Planning has been tasked with working to promote a good indoor environment (N2017/07419). This work includes identifying and investigating systemic faults within construction and widespread damage to the building stock. A report on this assignment is to be published no later than 31 December 2021.

The Government is of the opinion that an economic analysis of SHK's proposals is required.

More details about the assignment

The aim of the assignment is to provide the Government with a supplementary evidence base regarding the proposals in SHK's report. What is required as background material for the economic analysis is to specifically report a quantitative estimate of the number of construction projects and existing buildings, respectively, that would be affected by SHK's proposals. If the National Board of Housing, Building and Planning deems that it would be of major benefit to society if another subset of constructions than those which have parts corresponding to safety class 3 in accordance with the aforementioned regulations should be included in a system

involving inspections of the dimensioning of constructions by an independent party, this shall be indicated in the analysis.

The National Board of Housing, Building and Planning shall also conduct a comparison of the regulatory framework for recurrent inspections in Norway, Denmark and Finland, and a survey of the extent of the construction projects and existing constructions, respectively, in Sweden that would be inspected under the requirements that apply in each of the respective countries.

The National Board of Housing, Building and Planning shall also report on how introduction of a requirement for an independent party in the construction process, as per SHK's proposal, would affect the board's ongoing work on regulations.

On behalf of the Government,

[signature]
Märta Stenevi

[signature]
Ann-Kristin Kaplan Wikström

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Legal, Financial and Administrative Services Agency
Prime Minister's Office/FCK
Ministry of Justice/SSK
Ministry of Finance/BAI and VS