



**ONNETTOMUUSTUTKINTAKESKUS
CENTRALEN FÖR UNDERSÖKNING AV OLYCKOR
ACCIDENT INVESTIGATION BOARD FINLAND**

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**A COLLISION WITH PONTOON BRIDGE AND
CONSEQUENCES FOR OPERA FESTIVAL**

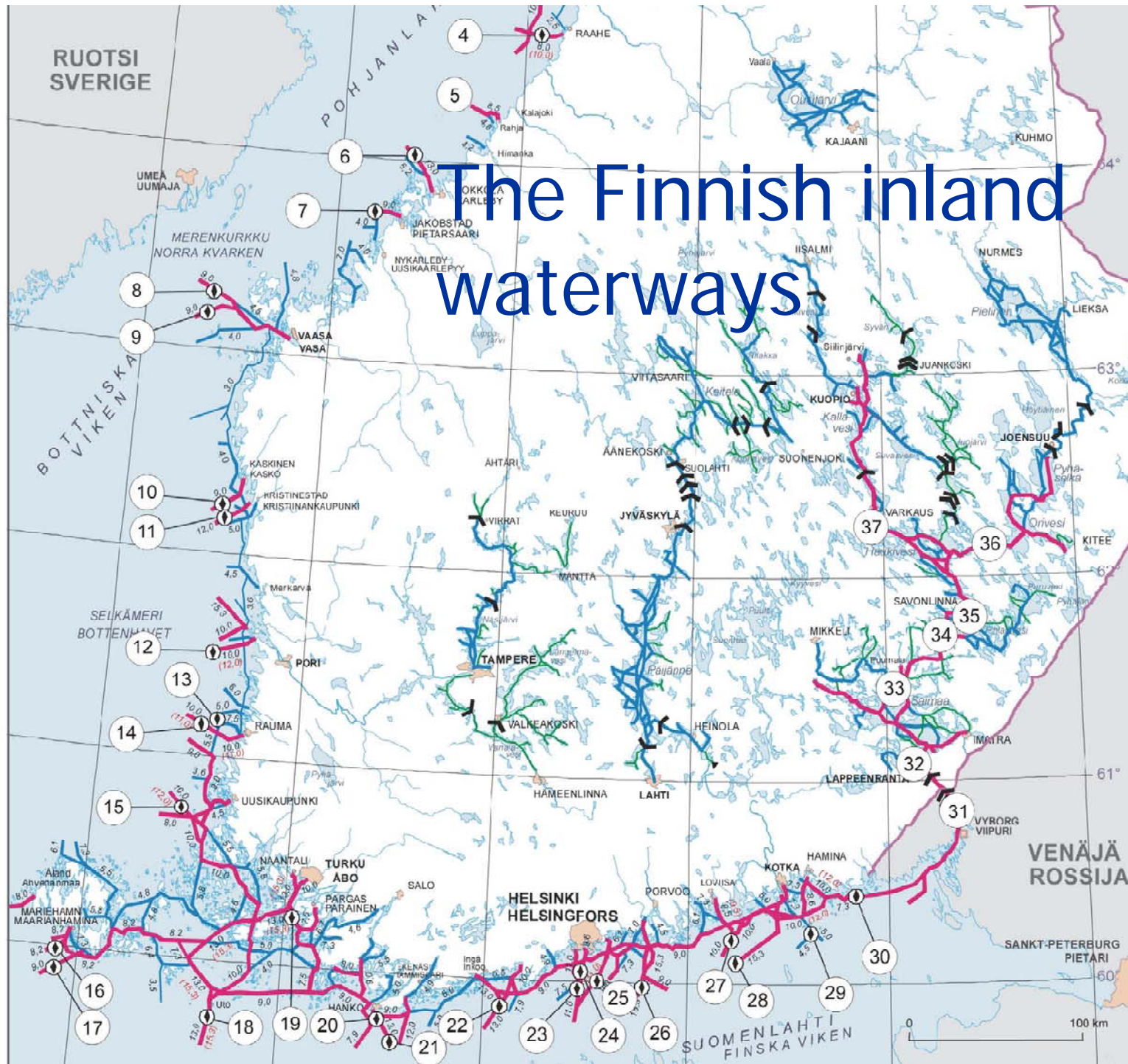
Martti Heikkilä

EMAIF 5

Budapest

29 - 31 March 2009

The Finnish inland waterways





Part 1

The KRASNOVIDOVO accident

- *Russian flagged river-sea vessel*
- *Built* *1980*
- *Length* *78,10 m*
- *Draft* *3,338 m*
- *GT* *1522*
- *Displacement* *2684 t*
- *Machine effect* *2 x 441 kW*





The KRASNOVIDOVO accident

ms KRASNOVIDOVO was on 18.7.2004 on its way to Varkaus nearly fully laden with timber. The Master of the vessel had been changed in St. Peterburg, and the Master now onboard was making this voyage on the KRASNOVIDOVO for the first time. This was also his and the Chief Officer's first voyage to the Saimaa Lake District.



The town
Savonlinna in lake
district in eastern
Finland



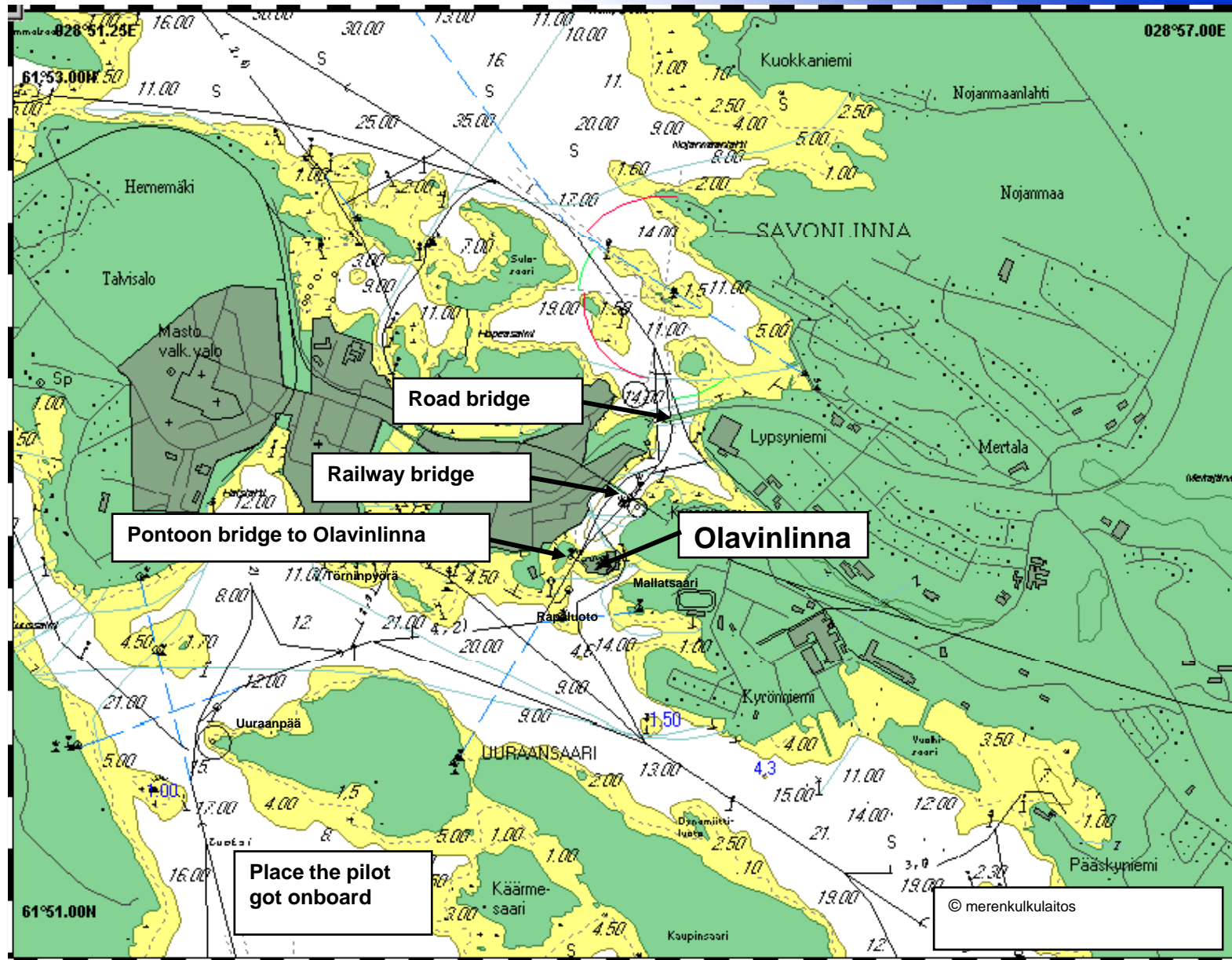


The KRASNOVIDOVO accident

Three Finnish pilots had piloted the vessel from the Saimaa Canal to Savonlinna. The new pilot carrying out the piloting from Savonlinna had embarked the vessel 20 minutes before the vessel entered the Kyrönsalmi strait which passes the Olavinlinna Castle.



The Olavinlinna castle and the pontoon bridge





The KRASNOVIDOVO accident

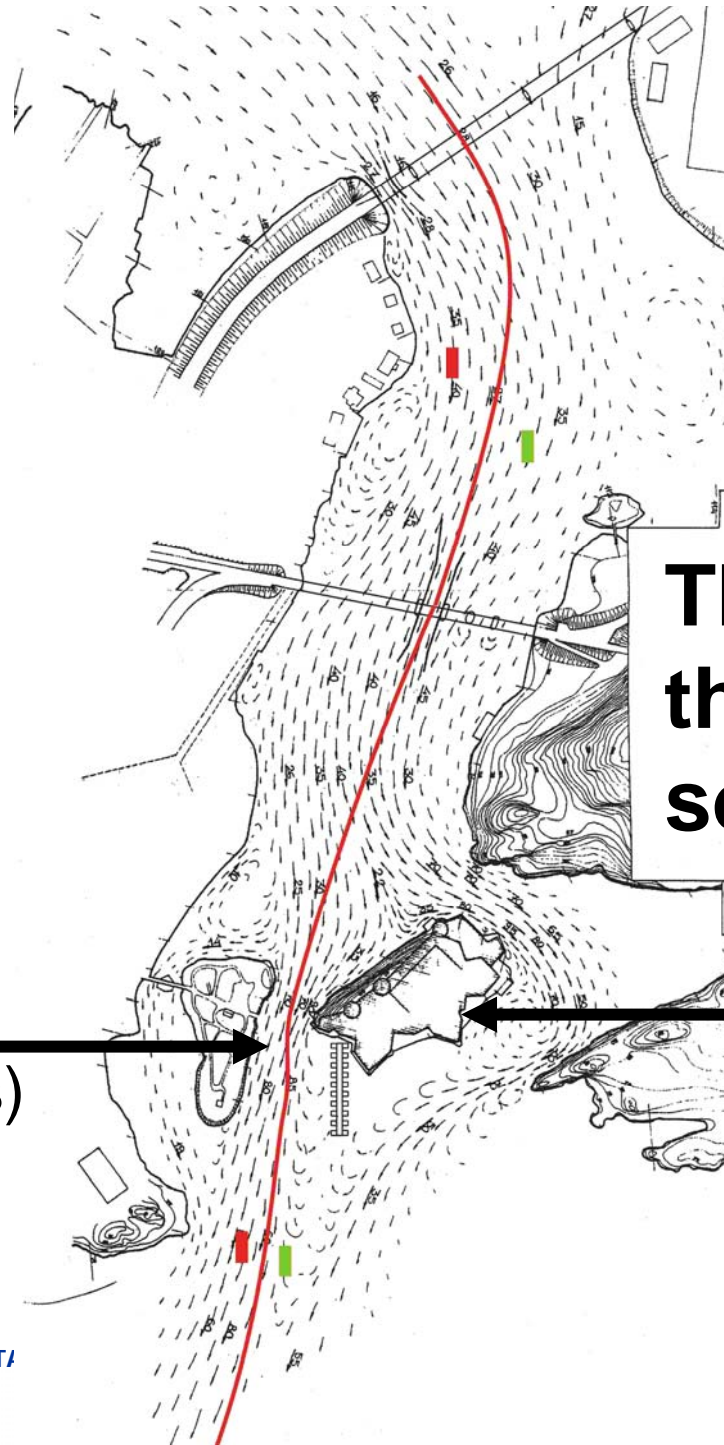
The pilot took over the manoeuvring of the vessel by manual steering. The vessel type was not familiar to the pilot, and he did not have time to get enough feel for the manoeuvring of the vessel before it reached Kyrönsalmi.

The pilot and the crew discussed neither the manoeuvring characteristics of the vessel in greater detail nor the earlier stages of the voyage.



The KRASNOVIDOVO accident

When the KRASNOVIDOVO approached Kyrönsalmi, the pilot noticed that the current was very strong in the strait. The vessel entered the inhomogeneous current field of Kyrönsalmi at an angle after a turn which had been too long. At the same time the pilot handed the manoeuvring over to the Chief Officer without informing about it in advance.



The currents in the Kyrösalmi sound

1 m/s
(2knots)

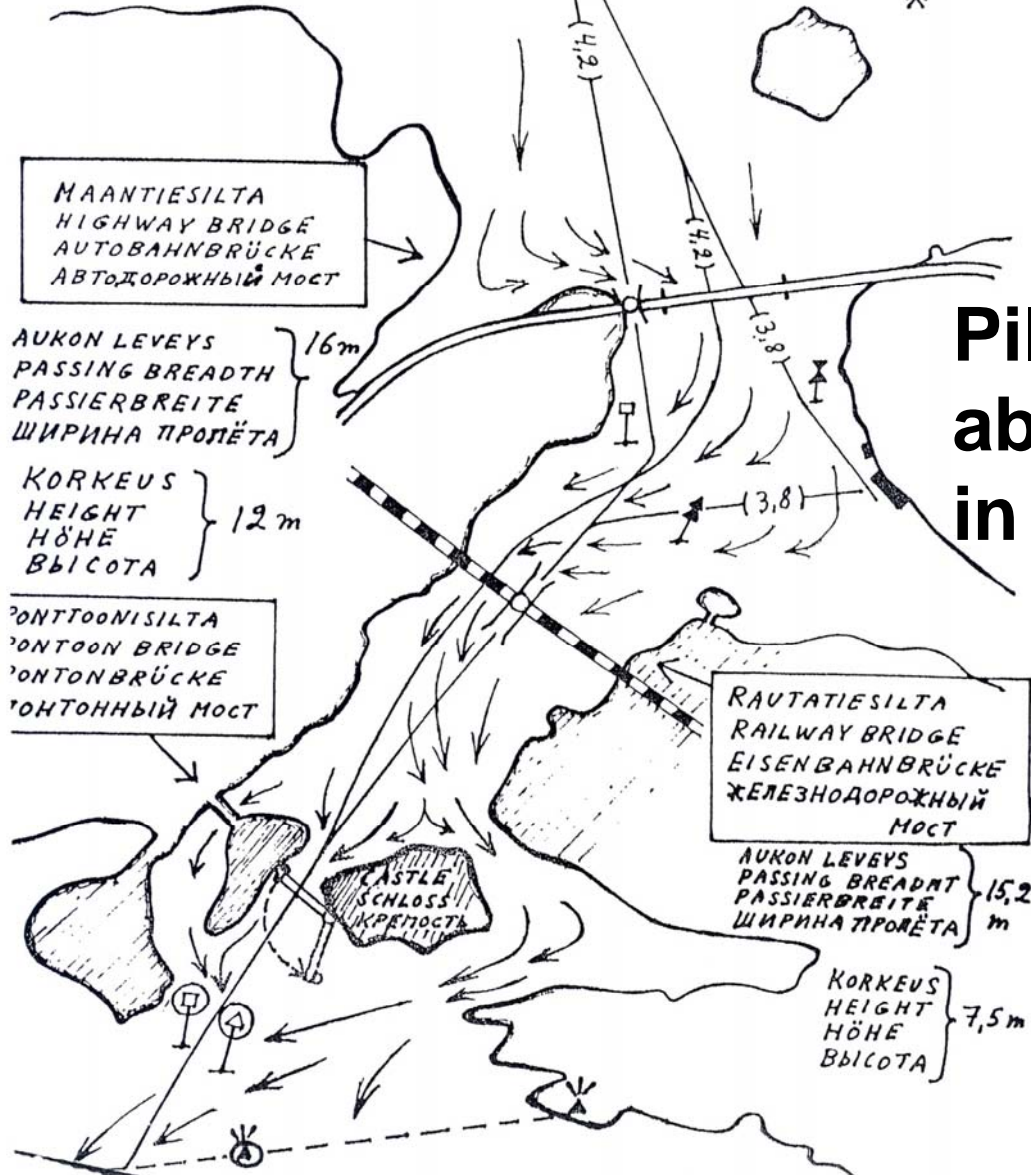


Olavinlinna
castle





KYRÖNSALMI
 STRAIT OF KYRÖNSALMI
 STRASSE VON KYRÖNSALMI
 КЮРОНСАЛМИ



Pilot information about the currents in Kyrönsalmi



The buoy (right) used as current meter by pilots

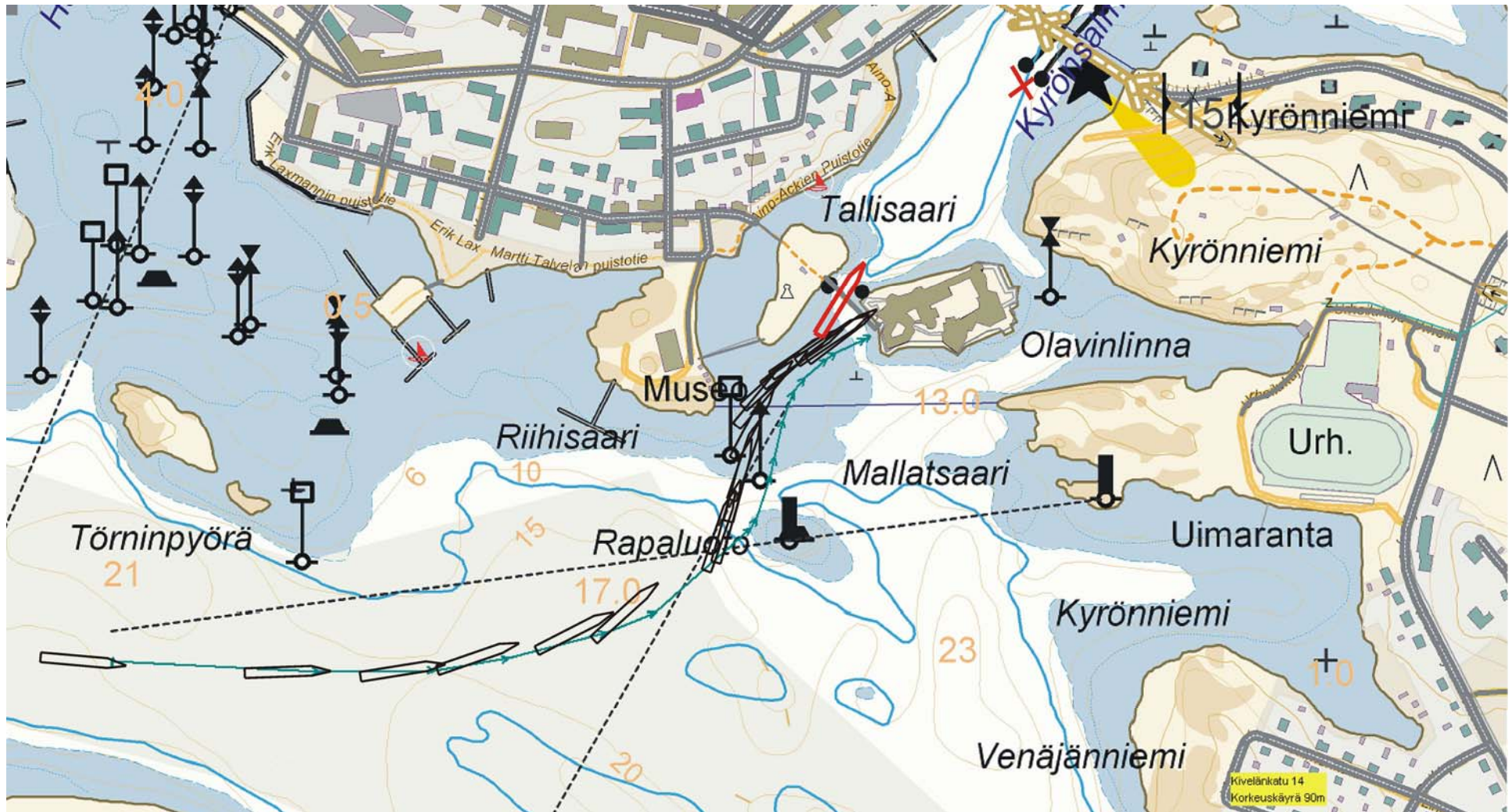


The KRASNOVIDOVO accident

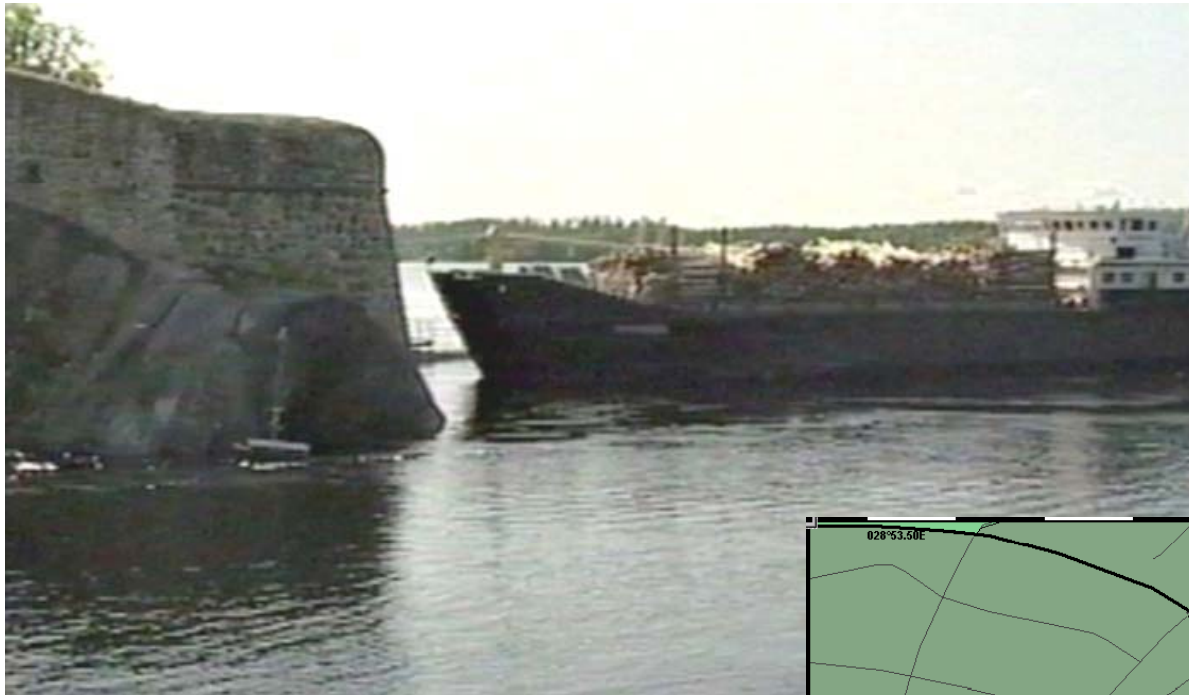
The Chief Officer took over the helm, and the Master started to handle the engine. After the vessel had started to take a strong turn in the opposite direction, the Master could not stop this turn quickly enough. The vessel first hit the Olavinlinna pontoon bridge, which was open, and then the cliffs of the island at a speed of a little less than three knots.



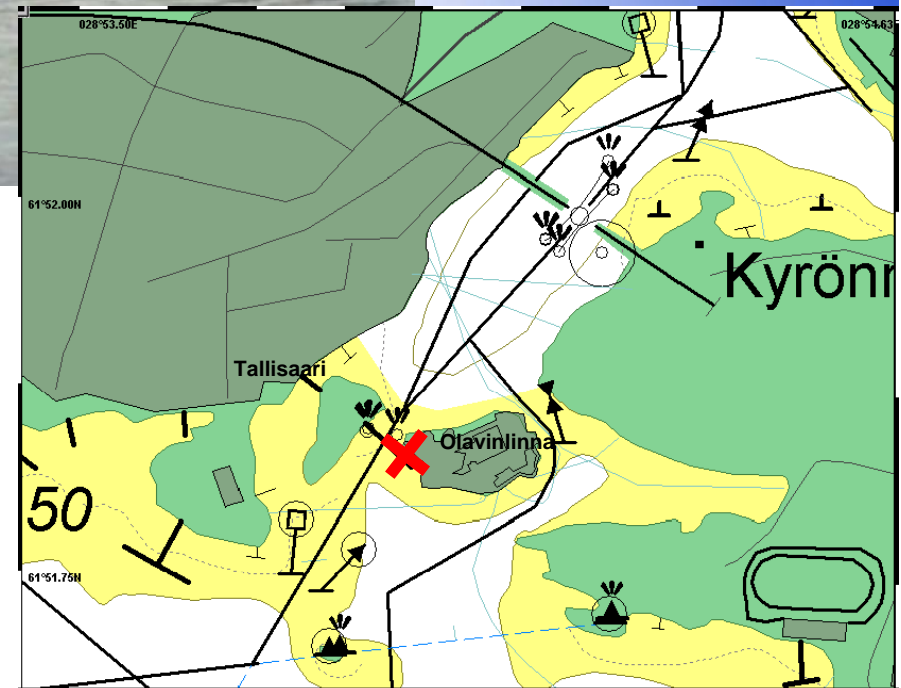
Correct angle of approach to Kyrönsalmi (photo taken on reconstruction run)

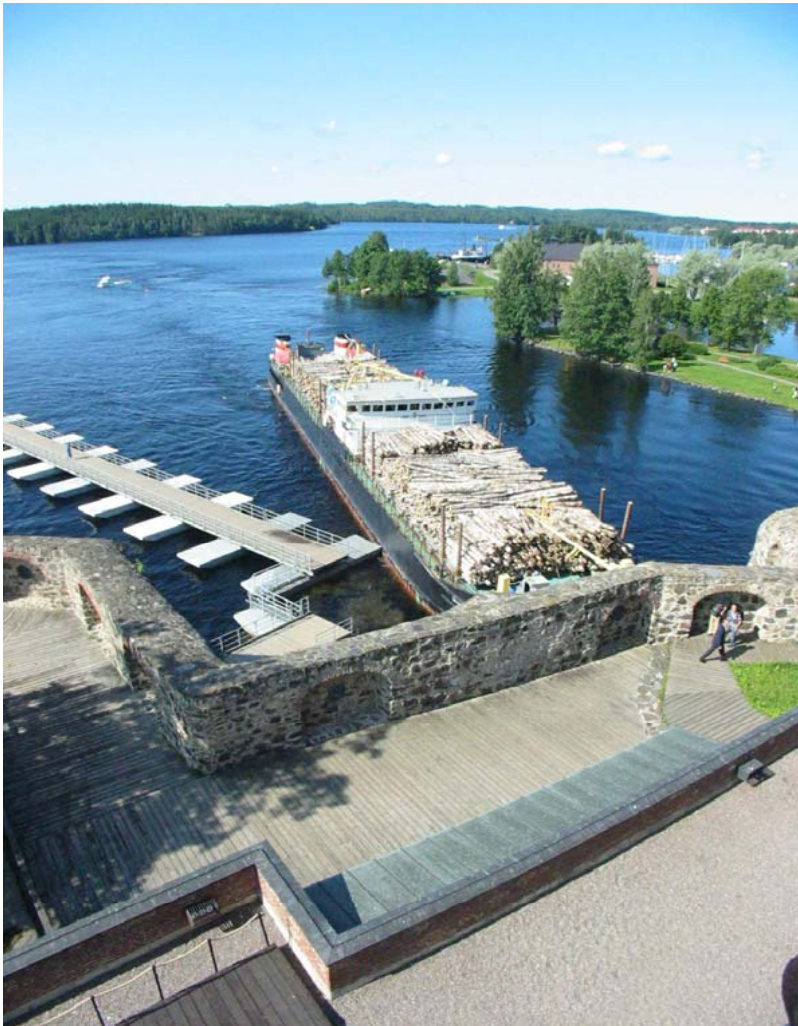


KRASNOVIDOVO track leading to collision extracted from VTS recorded AIS data



KRASNOVIDOVO
colliding the pontoon
bridge and hitting the
cliffs of the island at 3
knots





The damages on the KRASNOVIDOVO were minor, and a few minutes after the collision the vessel was manoeuvred through Kyrönsalmi.



The KRASNOVIDOVO accident

The KRASNOVIDOVO entered the Kyrönsalmi fairway at an angle, and the pilot handed over the manoeuvring without any prior notice. These two incidents together were the direct causes of the accident.

In a narrow fairway with a current even slight deviations in the steering of the vessel require good knowledge about the conditions in the fairway and excellent manoeuvring of the vessel.



Part 2

The Opera Festival public safety

In the collision the fastening of the fixed part of the pontoon bridge came partly loose, and it was no longer possible to use the bridge as a traffic route.

The first round of the Timo Mustakallio song contest was about to begin in the Olavinlinna Castle. A decision was quickly made to convey passengers on a transport ferry, which had not been inspected as a passenger-vessel.



Transportation of the festival public to the castle on a ferry not approved for passengers



The KRASNOVIDOVO accident occurred in the summer when the use of the Olavinlinna Castle for big events for the general public is most active. The accident also showed that the only planned route for a great number of people back to the mainland from the Olavinlinna Castle is very vulnerable to disturbances.

The historical constructions of the Olavinlinna Castle and its current usage as festival premises for thousands of people are inconsistent with current requirements on public safety.



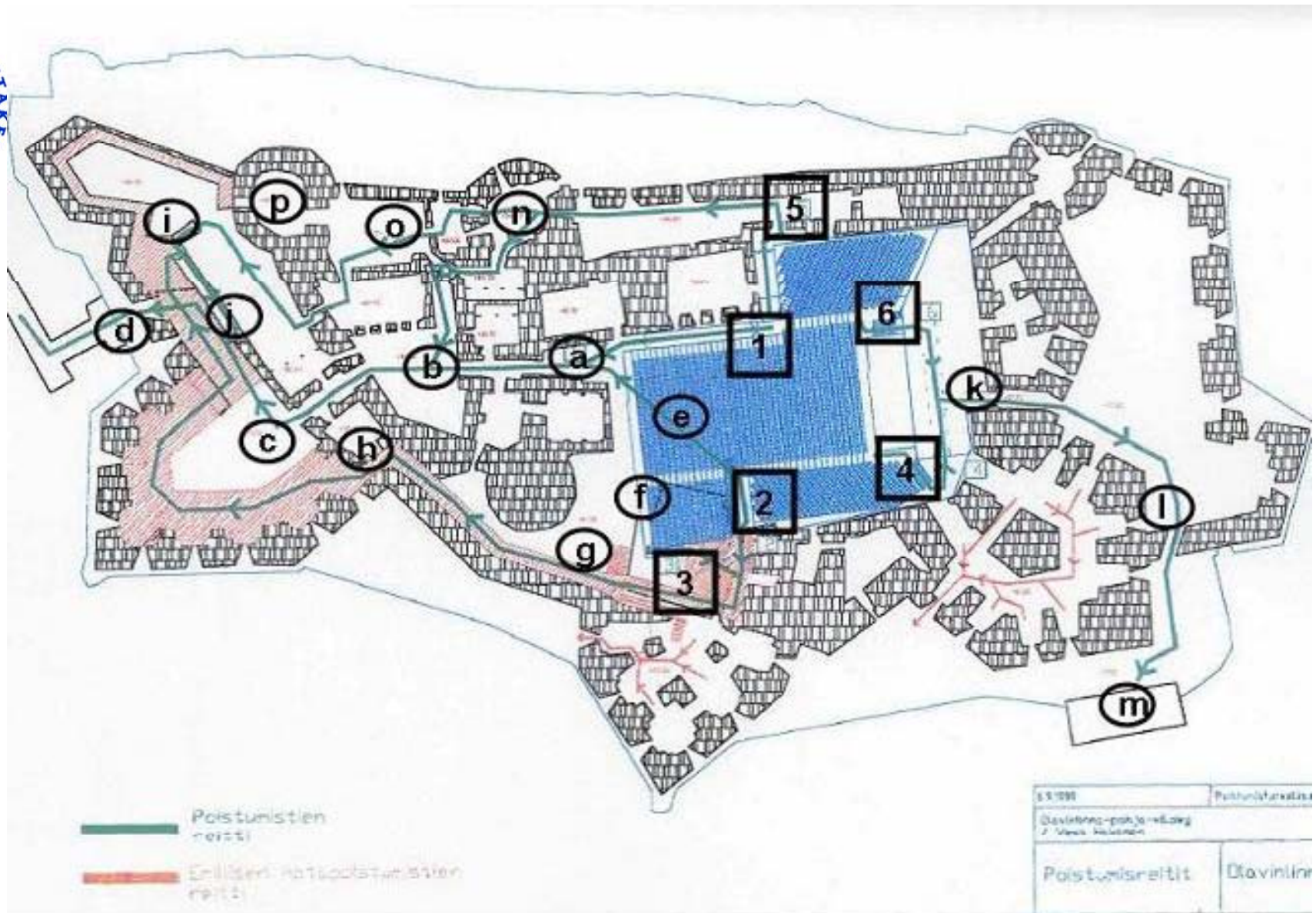
The safety arrangements at the Olavinlinna Castle constitute a whole, which is not restricted only to the usability of the pontoon bridge or the vessel accident. In 1989 the maximum allowed number of persons on the castle yard was established to **560**.

The combined width of the traffic routes to and from the castle is according to the current building regulations too small for the number of persons temporarily allowed at the gallery (**2257**) or at the whole castle (**2777**).



The gallery is constructed for the festivals in each year. Below the new gallery designed in 2000 and accommodating 2260.

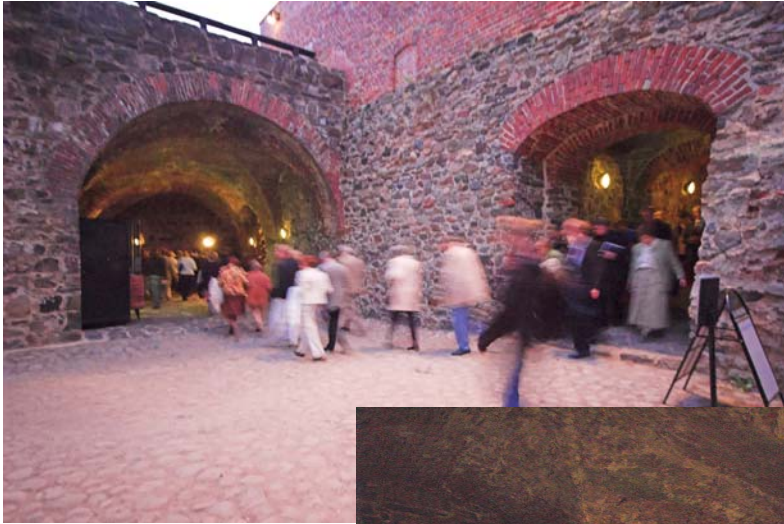




Escape routes from the gallery



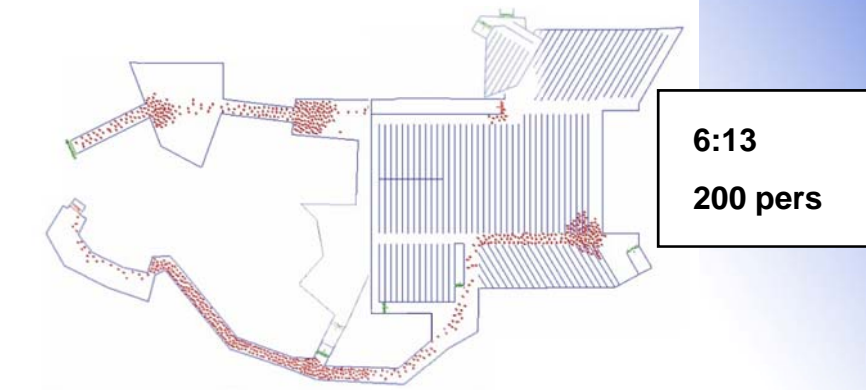
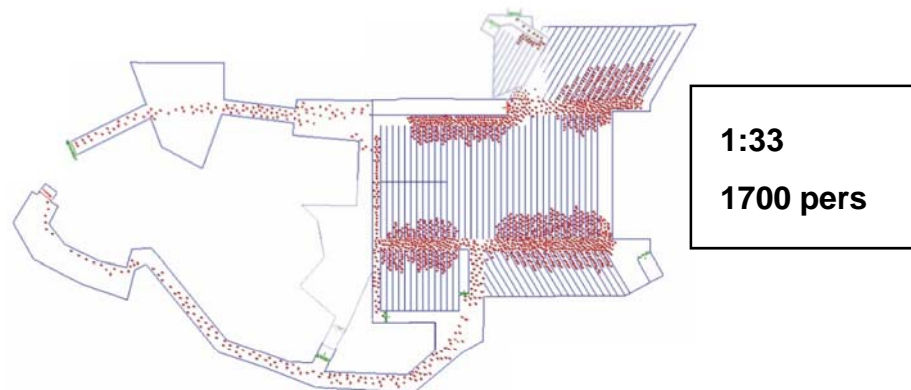
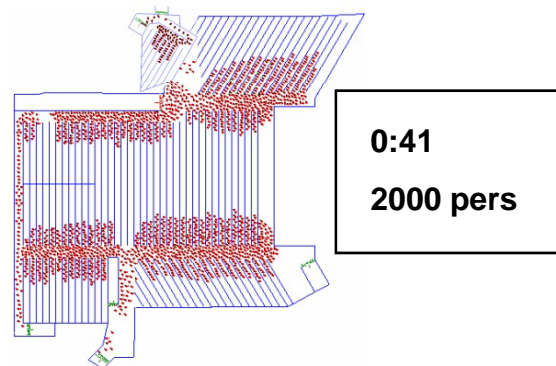
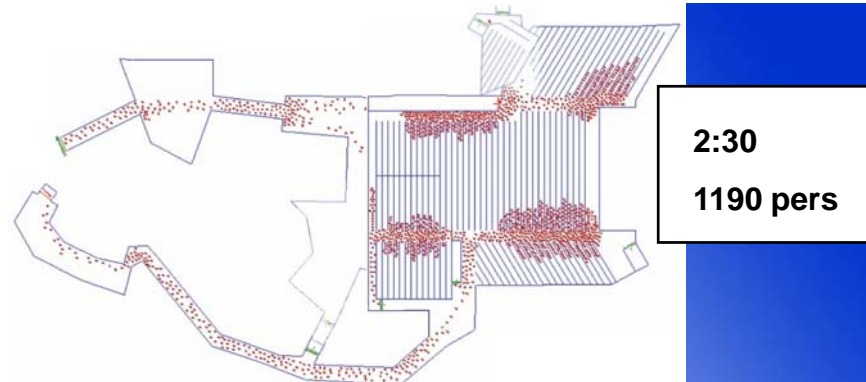
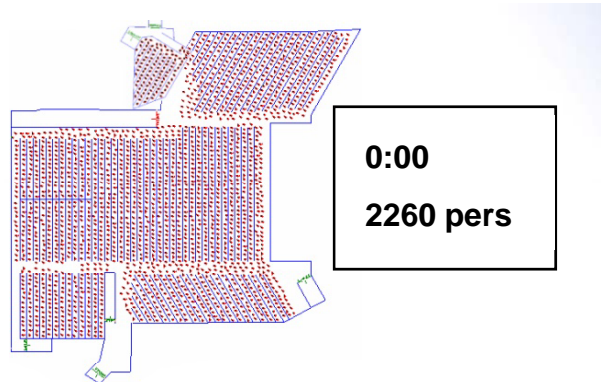
Escape routes from the gallery



Escape routes from the gallery



Escape routes from the gallery



Escape simulations, the gallery fully occupied



The decisions on the maximum number of persons are based on a practice which has continued for a long time, and the situation has not been reassessed when there have been rebuilding of the gallery and stage structures in 2000.



The KRASNOVIDOVO accident - safety recommendations

- better information about the currents in the strait to the users of the Kyrönsalmi fairway
- the transfer of the deep-water channel
- the development of piloting practices
- the special requirements on pilots navigating the more demanding fairway sections
- a thorough investigation of the public safety of the Olavinlinna Castle.



**Thank you
for
your attention**

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The Finnish waterways

