Investigation / Evaluation and experiences of SAR case no. 529, the fire onboard the passenger ferry m/s Prinsesse Ragnhild on the 8th July 1999.

Introduction.

The purpose of this investigation has been to describe, evaluate and gain experience from the SAR mission involving the fire onboard the passenger ferry m/s Prinsesse Ragnhild (PR).

The investigation is partly based on MRCC`s [1]SAR–log number 529, partly on the protocol from the Maritime Enquiry which took place at the Gothenburg District Court, partly on reports received from participating units and authorities as well as on interviews with MRCC staff-members.

The purpose of this investigation has by no means been to investigate the cause of the fire or to comment on aspects of safety at sea. The aim has been to investigate and gain experiences from the actual SAR-mission in order to improve the Swedish maritime SAR-organisation.

The investigation begins with a description of the actual course of events followed by a more precise analysis of the different functions used in the SAR mission, with comments and criticism of these. Each function-analysis contains certain recommendations to improve the SAR-function.

The investigation resulted in a total of 28 recommendations.
These recommendations are listed at the end of this investigation and are meant to bring about new routines within the Swedish Maritime Organisation.
A list of abbreviations is found at the end of this report.

[1] Records of SAR-missions are documented in a program called “Disco-SAR” at MRCC Gothenburg. This record is referred to as the “SAR-log” in this report.

The course of events.

At 01.55 on the 8th of July 1999, the Chief Officer on watch onboard the m/s Prinsesse Ragnhild, belonging to the Norwegian shipping company Color Line, is alerted via a smoke detector in the engine room of a fire. After checking with the Engineer on watch in the engine control room, a fire in the main engine room, starboard engine, is confirmed.
There are 1.167 passengers and 172 crewmembers onboard at the actual time. A total of 1.339 persons.

The course of events is described in the protocol from the Maritime Enquiry as follows:

01.55 Fire in the engine room is confirmed.
02.14 Mayday. Distress message is sent on VHF channel 16. Acknowledged by Farsund Radio (Norway) and shortly after by Sweden Rescue, MRCC Gothenburg.
02.20 Lifeboats, liferafts etc are prepared.
02.40 An attempt is made to use the fixed CO2 extinguisher system in the engine room, which fails to function.
02.46 Decision is taken to evacuate passengers.
02.54 Passengers are informed to proceed to the evacuation stations onboard.
02.59 Evacuation of passengers starts.
03.25 The CO2 extinguisher system is now operational.
04.15 Fire is now extinguished (or under control).
04.15 Prinsesse Ragnhild informs that all passengers except 4 (later to be corrected to 6) and crewmembers have been evacuated. This information is given by means of verbal communication.

At 02.13, according to the SAR-log and at 02.14, according to the Maritime Enquiry - the Captain is informed of the situation and a mayday distress message is transmitted on VHF channel 16. The Mayday is first answered by Farsund Radio in Norway and shortly after, as soon as there is a chance to break in to the radio traffic, Sweden Rescue i.e. MRCC Gothenburg responds to the Mayday and takes charge of the SAR-mission as the incident has occurred within the Swedish SAR region. The position is given as N 57.39 and E 11.19. (See chart extract)

The weather conditions during the entire SAR-mission are very favourable with good visibility. The air temperature is approximately + 18 degrees Celsius.

The Sar Mission Co-ordinator (SMC) judged the situation "Critical" and classed the case as "Distress".

The SMC made his [2]General Decision (GD) at 02.15, which according to the SAR-log read: "Relay distress message. Let MRSC (Stockholm Radio) receive and organise response – acknowledgements from merchant vessels in the area on VHF channel 67. Alert all available SAR air- and surface-units."

At 02.16 MRCC requested the assistance from ARCC Sweden. At 02.17 [3]SSRS (the Swedish Life-boat Association) stations in Käringön, Rörö and Hovås were alerted via selective-calls on VHF, and the mayday message was relayed according to the previously mentioned GD.

At the same time RCC Stavanger (Norway) offer their assistance as "supporting RCC" to MRCC Sweden.

At 02.20 a Support-Group is called in to MRCC Sweden according to an alert list.

At 02.23 off-duty MRCC staff-members are called in.

MRSC Stockholm is given the task of co-ordinating the merchant vessels responding to the distress alert.

SOK (Sörvärnets Operativa Kommando – the Danish MRCC) inform the MRCC at 02.19 that they intend to send 4 surface rescue-units to the area. At the same time the SSRS vessels PO Hansson and Märta Collin report that they are now leaving port for the area. Shortly afterwards the SSRS

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[2] The SMC always states his General Decision (GD) in the initial stage of any SAR-mission. The GD should describe the SMC's intentions and how he wishes to achieve the results in the mission. The GD is meant to be passed on to all participating units.

[3] SSRS – "Svenska Sällskapet för Räddning af Skeppsbrutna" – The Swedish Lifeboat Organisation, a non-profit association funded with contributions and operated by volunteers.

vessel Ulla Rinman reports similarly. These units arrive at the m/s Prinsesse Ragnhild at 03.05 according to the SAR-log.

Initially ARCC Sweden alerts the Säve Helicopter Base (Gothenburg) and one medical team on their minicall at 02.25.

At 02.29 a Fire Response Team (FRT) from the Gothenburg Fire Brigade is alerted and leaves for Säve Helicopter Base for further transport to the m/s Prinsesse Ragnhild.

At 02.47 the helicopter bases in Ronneby (Southeast Coast of Sweden) and Berga (Stockholm), as well as the Fire Response Teams in Stockholm and Helsingborg are alerted.

At 02.36 clearance was given verbally for 3 Norwegian helicopters to enter Swedish territory and assist in accordance with the Swedish permission regulations.

At 02.45 RCC Stavanger alerted, on request from MRCC Sweden, a Fire Response Team in Larvik to be transported to the scene in a Norwegian helicopter at 03.40.

At 02.50 Swedish Coastguard vessel # 288 arrives as first vessel on the scene to the m/s Prinsesse Ragnhild, followed shortly after by the faster of the SSRS vessels. Additional vessels from SSRS, the Swedish Maritime Administration, the Swedish Coastguard and the Swedish Defence Force followed.

11 merchant vessels including 5 passenger-ferries offer their assistance in the SAR mission.

The main task for the smaller surface units in the SAR mission consisted of towing approximately 50 liferafts and lifeboats with evacuated passengers from ms Prinsesse Ragnhild to other merchant vessels where the passengers were taken care of.

The ms Stena Danica took 614 passengers, m/s Kihlstraum 155, ms Black Watch 364 and the fishing vessel Matilda 25 passengers, making a total of 1.158.

The evacuated passengers that were taken care of onboard the above mentioned vessels, except Matilda, were later transferred to Älvsnabben

no. 4 and Älvsnabben no. 5, two smaller passenger ferries servicing the Gothenburg archipelago and owned by the Styrsö Ferryboat Company (Styrsöbolaget), as well as certain other smaller vessels for further transport to the NCW (Naval Command West – a military camp) which served as assembly point for the evacuated passengers. The fishing vessel Matilda also took its passengers to Tångudden in the NCW grounds.

Helicopters also participated to a certain extent in the transportation of passengers from ms Stena Danica to the assembly point. This was later criticised seeing these passengers already were in safety onboard Stena Danica.

3 passengers were flown by helicopter directly to hospital.

At 04.15, two hours after the initial distress call and one hour sixteen minutes after the evacuation started, ms Prinsesse Ragnhild announced that all passengers except 4 (later to be corrected to 6) and the crew had been evacuated. They also informed that the fire now had been extinguished.

The favourable weather conditions as well as professional conduct of all ships crews involved contributed greatly to the successful evacuation of the passengers from the ms Prinsesse Ragnhild, the relatively smooth transportation of these to the participating merchant vessels and the successful gathering of the liferafts. Given different conditions at another time of year, with strong winds and rough seas, the operation would have had great difficulties to succeed if the Captain had made the same decision to evacuate in the same way.

In the Maritime Enquiry at the Gothenburg District Court the Captain was asked if he would have decided to evacuate his ship in the same manner under worse weather conditions i.e. colder temperature, stronger winds and rougher sea.

The Captain replied that under the same circumstances, with the information he held that the fire was worsening and that the heat was spreading in the vessel, along with his knowledge of the resistance times of the isolation material used onboard, he would have made the same decision to evacuate, even under more severe weather conditions.

At 06.04 a tug was made fast to the ms Prinsesse Ragnhild with the intention to tow her to Fredrikshamn in Denmark. This destination was

later changed to Gothenburg, as a result of discussions between Ship-Inspectors and the Port of Gothenburg.

At 06.16 the Ship-Inspectors informed that it had been double-checked that there were no remaining passengers onboard and that the situation was under control.

At 07.47 the tugs Per and Lars are made fast and start towing ms Prinsesse Ragnhild to Gothenburg Port.

At 12.55 ms Prinsesse Ragnhild is alongside berth number 601.

During the evacuation Fire Response Teams from Gothenburg, Helsingborg and Stockholm were alerted at first, and somewhat later even from Norway (Larvik) and Denmark (Fredrikshamn).

Difficulties arose in putting the Fire Response Teams directly onboard the PR, and it was therefore decided to drop them of on other suitable vessels for further transportation with smaller units.

The first Fire Response Team on the scene came from Frölunda fire-station in Gothenburg and were flown out by helicopter to the ms Stena Danica and from there transported with a smaller vessel to the PR. Certain difficulties were encountered in boarding the PR.

At 04.50 the first Fire Response Team from Frölunda were onboard the PR, 35 minutes after that the PR had announced that there were no longer any passengers left onboard, except for a few truck drivers that stayed onboard at their own choice.

Shortly afterwards Fire Response Teams from the Kortedala fire-station in Gothenburg, from Larvik in Norway and from Fredrikshamn in Denmark boarded.

Seeing that the PR had no “Helicopter Landing Area” these teams were all transported via other passenger ferries (Stena Danica and Queen of Scandinavia) with smaller units to the PR, at a certain time-loss. It was decided not to use the “Helicopter pick up area” available on the PR. This decision was later changed.

At 06.09 it was informed that there were four Fire Response Teams onboard - one Danish, one Norwegian and two Swedish.

The Fire Response Team from Helsingborg, Sweden was transported by helicopter to Säve Helicopter Base where they arrived at 05.35, or shortly thereafter.

They then waited there together with a Fire Response Team from Stockholm as backup until 08.30 when they were flown out to release the two Swedish teams and the Danish team.

The Fire Response Team from Stockholm was alerted at 02.45 and left for Berga Helicopter Base for further transport by helicopter to Gothenburg. However, the first team awaited a medical team (which was not requested from MRCC), delaying their departure from Berga until 04.28.

The second team from Stockholm was cancelled at 05.04 after they first had waited at Berga and later were flown to Huddinge Hospital to collect a medical team.

The decision to await medical teams was taken by the helicopter Pilots without the SMC's knowledge at MRCC.

As mentioned a considerable amount of helicopters were used in the mission. Not less than 8 Swedish, 3 Danish and 2 Norwegian helicopters were alerted. Subsequently 4 Swedish helicopters were cancelled, totalling 9 helicopters that were actually used in the mission.

The helicopters were mainly used to transport Fire Response Teams to amongst others, Stena Danica, seeing the PR was supposed incapable of receiving helicopters, as before mentioned.

Four persons suffering from smoke-inhalation were transported by helicopter to Östra Hospital in Gothenburg. Some helicopter also transported passengers from Stena Danica to the assembly point at NCW, which was deemed unnecessary seeing the passengers already were in safety onboard the passenger ferry. This fact was also responded to in several reports following the mission.

Total amount of SAR units engaged in the mission:
SSRS: Rescue-boats Märta Collin, PO Hansson, Ulla Rinman, Dan Broström and Lars Prytz.
Swedish Maritime Administration: Pilot-boats nos. 739, 735, 556 and 742.
Swedish Coastguard: Coastguard vessels nos. 288, 447, 483 and 050.

Swedish Military Forces: 3 Combat-boats (model Stridsbåt 90), 1 "Trossboat" and 1 minesweeper.
Styrsö Ferryboat Company: "Älvsnabben" nos. 4 and 5.
Rescue-boat Göte
Danish Rescue-boat Samsö
Tanker mt Tell
Passenger-ferry ms Stena Danica
Chemical-tanker mt Kihlstraum
Passenger-ferry ms Black Watch
Fishing-vessel Matilda
Tanker m/t Futura
8 Swedish helicopters, whereof 4 subsequently cancelled.
5 foreign helicopters (2 Norwegian and 3 Danish)
Fire Response Teams from Sweden (Gothenburg, Helsingborg and Stockholm), from Denmark (Fredrikshamn) and from Norway (Larvik).

Evaluation and description of the various SAR-functions involved in the SAR operation.

Co-ordination and staff-management within MRCC

At the time of the incident the combined co-ordination center at Kärringberget [4]LCK was manned as follows:

- The Swedish Maritime Administration, MRCC – one SMC, responsible for the watch keeping of the international distress frequencies on the medium (MF) and very high (VHF) frequencies.
- The Swedish Coastguard – one watch-keeping officer
- The Swedish Defence Force – one sea-surveillance officer

In addition there was one maritime SMC (MRCC) and two aeronautical SMC's (ARCC) asleep in the building on standby-duty, immediately alerted by telephone and in operation in a matter of minutes.

The MRCC was thus manned with a single SMC at the time of the alarm, according to the manning-plan for MRCC, and he was therefore quickly over-extended at the initial stage of the operation. MRCC staff were to be called in, SAR units to be alerted, neighbouring countries MRCC`s to be contacted, instructions to be given to MRSC Stockholm in addition to keeping a dialogue with the PR and other ships in the area responding to the distress call.

If the MRCC staff were to alert the Fire Response Teams according to the existing instructions and checklists, other actions may possibly have been delayed.
This task was therefore delegated to the ARCC by the deputy-SMC (MRCC) in this case. This action can obviously be questioned, should MRCC themselves have performed this task?
The fact that all steps in the checklist regarding the alerting procedures of

[4] LCK – LedningsCentralen Kärringberget. The LCK is a combined co-ordination center consisting of four separate authorities, The MRCC, the ARCC, the Swedish Coastguard District West and the Military Sea-surveillance West.

the FRT were not followed is, however, not supposed to have affected the mission in any way.

Judging by the reports from the SMC and the deputy SMC (MRCC), their co-operation was not satisfactory at the initial stage of the mission, specifically during the alerting phase. Not until another SMC qualified MRCC staff-member arrived at MRCC was the on-duty SMC able to concentrate on, and catch up on his usual tasks, some of which had been put aside at the initial stage.

Even the reports from the ARCC show that they were uncertain over who was SMC, who was deputy SMC etc in the MRCC.

According to established routines and methods at the MRCC the deputy SMC is to relieve the SMC from the [5]radio-room in the case of an alarm and enable him to man the SMC position and concentrate on the his specific tasks. It is important that the SMC is given the opportunity and time and to "step back" and acquire an overall, objective picture of the situation in order to be able to take the correct overall decisions.
In this case the SMC was not relieved from the radio-room, giving him this opportunity and was subsequently totally involved in the operational tasks.

This situation in the initial stage has several explanations. The reports from the SMC and deputy SMC as well as interviews with them show that they had different views on this point.

The SMC felt he was never properly relieved from the radio-room whereas the deputy SMC felt he was not able to establish an acceptable dialogue with the SMC and therefore acted on his own. This problem was not solved until an additional SMC qualified MRCC staff-member arrived at the MRCC. It's possible that the deputy SMC didn't realise his role in the staff-organisation, though it is also quite possible that the deputy SMC was actually unable to establish a satisfactory contact with the SMC seeing he was occupied with the radio-communication.

[5] The radio-room at the MRCC is a room adjacent to the SMC-desk equipped with a monitoring system and speakers for communication on the maritime distress frequencies (MF and VHF)

It is nevertheless important to point out that there are established routines for staff-management at the MRCC. The problem in this case seems to be that these routines were not fully followed for several reasons. The above mentioned is clearly one.

One conclusion of this, amongst others, is that the aims set regarding manning and education of staff in the authorities involved in the [6]JAMRCC project, have not yet been met.

In practice this means that the MRCC staff is understaffed in the initial stage and cannot fulfil the requirements regarding the manning of the MRCC in a classified distress situation. The staff reinforcement available initially does not always have the necessary training in staff-management that is required.

The staff was reinforced with additional SMC qualified staff-members during the course of the operation. This noticeably improved the staff co-operation, which eventually was satisfactory.

The co-operation between the MRCC SMC and the Coastguards Duty Officer worked very well. The Duty Officer also states in his report that when the LCK was fully manned and staff-members had found their places, the operation then ran smoothly.

A CT-decision (CT-decision Nr 1/98) has also been made by the CTS (Director of Maritime Rescue at the Swedish Maritime Administration) in this matter relating to a SAR-mission in 1998 off the South Coast of Sweden, the so-called ”Ystad-case”. This decision stipulates the need for staff-management training at the MRCC. This training has still not taken place.

The SMC also comments on Farsund Radios initial involvement in the mission in his report. Instead of immediately handing over the co-ordination and communication of the mission to MRCC Gothenburg, in whose SRR (Search and Rescue Region) the incident occurred, Farsund Radio continued their communication with the PR to such an extent that the MRCC SMC eventually found himself forced to interrupt their

[6] JAMRCC – Joint Aeronautical Maritime Co-ordination Center. There is an on-going project with the ambition to integrate the ARCC and MRCC in Sweden.

communication so as not to lose control of the overall co-ordination of the mission. Farsund Radio have later explained that they were uncertain over the actual position of the PR, had they known it was within the Swedish SRR then they would immediately have handed over the overall co-ordination to MRCC Gothenburg.

Recommendations regarding the management and staff-methodology at MRCC-Gothenburg.

- The competence and possibilities of co-operation within the LCK as a whole, as well as the separate functions individually should be further looked into.

- Staff-exercises with the purpose of training and improving staff-methodology and to create routines for forming working-teams. (In accordance with the CT decision 1/98)

- All SMC's shall be trained in handling major SAR-missions and, if necessary, made aware of the specific issues concerning missions of this magnitude.

MRSC-Stockholm

In the GD made at 02.15, it was decided to delegate MRSC Stockholm to receive the incoming acknowledgements from other merchant vessels in the area on VHF channel 67. At 02.17 it was also decided that MRSC Stockholm should handle the co-ordination of these vessels. MRCC Gothenburg later regained these tasks at 02.57.

At 03.00 MRSC is given responsibility of the routine radio-watchkeeping on channel 16 by MRCC.

At 03.11 a list of ships responding to the distress is faxed by MRSC to MRCC. This list is however not acknowledged by MRCC who therefore request this list once again at 04.11.

The SMC at MRCC has described that he felt MRSC did not properly observe his initial delegate to them. According to MRSC log no.33 it is however apparent that this is not the case. The delegated tasks seem to have functioned properly though the communication / information between the MRCC SMC and the MRSC has been insufficient to a certain extent.

Recommendations concerning the MRSC-function.

- Routines shall be established so that the MRSC-function can be involved in the best possible way in major SAR-missions. The MRSC should be considered a part of the MRCC staff and shall be utilised efficiently. This recommendation should be co-ordinated with the recommendations concerning the MRCC.

Comments on the Norwegian report regarding MRCC Gothenburg's co-ordination in the mission.

Coast-radio

1. *"It seems it took too long for Sweden Rescue to acknowledge the Mayday"*
   An examination of the recordings of the VHF communication proves that this may be the case. A female operator acknowledged the mayday first, approximately 25 seconds thereafter a male operator took over and requested confirmation of the position from PR. This communication between Farsund Radio and PR took 55 seconds. It was not until now that MRCC Gothenburg was given the opportunity to break in and respond to the mayday, which they also did.
   This first communication between MRCC Gothenburg and PR thus took place 55 seconds after the initial mayday. This communication was made in Swedish and was the only occasion any other language than English was used during the alert-phase.

2. *"the use of the Norwegian / Swedish languages in passing of information …… withholds foreign vessels the opportunity to follow the situation / position".*

   This criticism is not understood seeing all communication between MRCC, OSC and rescue-units was in English, which is even confirmed by the VHF recordings. Swedish and Norwegian are however used in the alert-phase as mentioned previously. Several reports show that communications between certain SAR units were in Swedish / Norwegian and it is possibly this fact that the Norwegian reports refers to.

   It could also be that it refers to direct communication between MRCC Gothenburg and RCC Stavanger (Sola). The Swedish

Maritime Administration have earlier emphasised the importance of the use of English in SAR exercises.

3. *"after approximately 14 minutes no vessels were answered by Sweden Rescue though calling repeatedly on channel 16"*

   This observation is both correct and most important. The VHF recordings show that 10 calls were made to Sweden Rescue from vessels between 13 and 14 minutes following the initial mayday without reply.

   The person in charge of watchkeeping in the radio-room (in this case the SMC) was occupied with a telephone conversation with MRSC, delegating the radio watchkeeping to them, and was thereafter trying to establish contact with the deputy SMC at MRCC.

Helicopter crews

4. *"there were chaotic occasions concerning the communication with- and co-ordination of the helicopters …"*

   MRCC requested that ARCC should find a helicopter willing to perform as Aircraft Co-ordinator (ACO), the helicopter pilot however considered this function unnecessary. The Norwegian comment shows that there was a need for this function and an ACO was also appointed at a later stage in the mission.

The Co-ordination Centre

5. *"the need of information to all parties involved in a similar situation"*

   This observation is correct but most difficult to live up to, especially in the initial stage of the mission. It should be emphasised that the task of sending Situation Reports (SITREPS) to supporting RCCs was fulfilled as soon as the staff at MRCC Gothenburg was reinforced and a staff member was assigned to this task.

   Even the Danes have mentioned the need of SITREPS in their comments on the mission.

6. *"it was easier to come in contact with the ARCC than MRCC Gothenburg …"*

   This important observation is positive as it points out another channel for communication with the RCC in an ongoing mission and is in accordance with the aim of integrating the ARCC and MRCC in Gothenburg.

Recommendations concerning observations from Norway and Denmark.

- In international SAR-exercises or exercises of an international character, the English language shall be used.
- The issue of satisfactory communication-equipment for Fire Response Teams shall be discussed further within the Fire Response Team Co-ordination Group. *(See recommendations concerning Fire Response Team*)

Communication

Certain SAR surface-vessels have criticised the fact that a specific channel for communication between OSC and SAR-units wasn't designated by the SMC at an earlier stage which resulted in an overload on channel 16. Criticism has also arisen over the use of Swedish from the SAR-units. Despite the attempts from SMC to stipulate English as the operational language, several units continued to communicate in Swedish.

All FRTs have mentioned that the communication both within the team as well as between teams failed to function satisfactory with the radio equipment they carried. The 400 MHz frequency worked as long as they were on the same deck but failed when on separate decks. Attempts were also made to communicate on the 80 MHz frequency (channel 54) without any better results.

It has been referred back for consideration that separate frequencies should be designated for air- and surface units. This matter should be further investigated.

Recommendations concerning communication.

- In major SAR-missions where a large amount of SRUs and an OSC are involved as well as in major SAR-exercises, the SMC shall, if

required, designate a working frequency for communication between SRUs and OSC.

- Further recommendations concerning communication are listed under "*Recommendations concerning Fire Response Teams*" and "*Recommendations concerning observations from Norway and Denmark"*.

- The effects of distributing separate frequencies to air- and surface-units involved in SAR-missions should be further investigated and evaluated.

The Support Group

In major SAR-missions and other incidents where the SMC finds it necessary, a Support Group can be called in as a reinforcement of the MRCC. The group is called in according to a specific telephone-list.

The Support Group has two functions, partly to provide expert advice to the SMC and partly to keep their own organisation updated on the results / intentions in the mission i.e. expected tasks, number of casualties, amount of people to be taken ashore etc.

The Support Group cannot take over management of the operations, this responsibility always lies on the MRCC and the SMC specifically.

The CMRCC (Head of MRCC) on duty was alerted by telephone in his home at 02.30 by the Coastguards Duty-officer. He was informed of a fire on board a passenger-ferry in the position off the island of Vinga.

He immediately drove by car to the MRCC where he arrived at 03.00 and logged himself in on the mission. His first step was to get updated on the situation. He thereafter informed the Traffic-area Director (the responsible Director in whose sea-area the incident had occurred), the Public Relations Director and the Director of Maritime Rescue at the Swedish Maritime Organisation.

The Sea-Surveillance Duty-officer (Swedish Defence Force), a stand-in for the summer in this case, was asked to summon the Support Group according to the telephone-list by the MRCC. As time went by the Support Group was joined by other representatives from the Swedish Maritime

Inspection, a Fire-engineer (who even functioned as co-ordinator for the FRT), Police, a Medical-adviser and the Director for the Kattegatt Sea Traffic Area.

The Support Group seems to have functioned satisfactorily until the CMRCC had to leave it. Thereafter the group seemed to have split up and certain members tried to help out in the MRCC operations-room. According to the reports from the SMC and the deputy SMC this help was not always welcome, and at times felt like an annoying interruption.

At one point the representative from the Fire Brigade interrupted the MRCC staff member in the radio-room who was busy communicating with rescue-units and the OSC, and demanded to speak directly with the Captain onboard the PR. According to him he had been given permission by the SMC.

This is a typical example of an unacceptable procedure, where the Fire Brigade representative, in this case with the SMC's approval, had misunderstood his authorities.

He should rather have informed the SMC of the information he required from the Captain, who in his turn could have contacted the PR.

The operational work within the MRCC is clearly interrupted when Support Group members exceed their authorities and their specific tasks.

Recommendations to improve the Support-Group function.

- Specific tasks and routines for the Support-Group are to be established in connection with the implementation of the recommendations concerning the MRCC and MRSC functions.

Surface-units

A total amount of 28 surface-units belonging to the Swedish Lifeboat Association, the Swedish Maritime Organisation (pilot boats), the Swedish Coastguard and the Swedish Defence Force were involved in the mission. These vessels are ordinary Sar-units in the Swedish SAR-organisation. Several other merchant vessels including passenger-ferries participated apart from the above mentioned. Small passenger vessels belonging to the Styrsö Ferryboat Company were also requested and assisted in the evacuation. Princesse Ragnhilds own lifeboats were also involved in

transporting passengers from the PR to the other merchant vessels in the area.

According to reports from the surface-units difficulty was encountered in the handing over of passengers from smaller units to larger units and merchant vessels due to the difference in height between the vessels. This difference in height caused delays and queues of surface-units waiting to hand over their passengers. Several reports indicate that this method of evacuation would have been impossible in worse weather conditions.

Reports show that Coastguard-vessel 288 evacuated and transported 73 persons from liferafts to the ms Black Prince. Even other SAR-vessels, amongst others the ms Ulla Rinman, evacuated people directly from liferafts to larger vessels.

The emptied liferafts were gathered up by other SAR-units and towed to the bunker barge ms Tell, where they were lifted onboard by crane and eventually transported in to Gothenburg. This eliminated the unnecessary work of searching through liferafts several times. This has also been pointed out in several of the reports.

After the larger ferry-vessels had taken onboard evacuated passengers they departed the area for Gothenburg, ms Stena Danica went to the Scandia-terminal and ms Black Prince to the anchorage in the Rivöfjord. The evacuated passengers were thereafter further transported by the smaller Styrsö Ferryboats numbers 4 and 5 to the reception point at Tångudden, within a military base

The report from the Styrsö Ferryboat Company mentions that they are not adequately manned for missions of this extent. It also states that the difference in height between their boat ms Älvsnabben 4`s foredeck and the shelterdeck of the larger ms Kihlstraum created difficulties in the handing over of passengers seeing there was no appropriate gangway. The Styrsö Ferryboat Company also request clarification on the Swedish Maritime Administrations opinion on the exceeding of their designated geographical area when involved in a SAR-mission.

The Maritime Inspection has been contacted in this matter and they state that the Ship Safety Act, the Swedish Rescue Services Act and the Maritime Law can be applied.

The Ship Safety Act states the area, and at which level of minimum manning the vessel is allowed to operate.

The Swedish Rescue Services Act on the other hand states that any authority, company or person is obliged to assist the SMC on request in a SAR-mission. The only restriction in this case is stated in the Maritime Law, a captain may refuse to participate if it involves a major risk for his ship or its crew.

In this case the ms Älvsnabben #4 and #5 have probably not exceeded their geographically designated areas and therefore not violated the Ship Safety Act. Had they exceeded their limits, they would still not have violated the Ship Safety Act, seeing they were responding to the SMC's request and not on a commercial job, and therefore acting indirectly under the Swedish Rescue Services Act.

This gives the Captains on these vessels the possibility and obligation to assist in other areas than they are certified and manned for, as long as the Captain sees his vessel and crew fit for it under the given circumstances.

It is solely up to the Captain on every ship to consider the risks for his ship and crew, when deciding to participate in a SAR-mission or not.

In conclusion, the outstanding performance of the participating SAR-units must be emphasised. Their joint effort along with the favourable weather conditions were, without doubt, the basis of the successful outcome of this mission, the largest evacuation in a SAR-mission at sea in Swedish history. Their prior experience in actual SAR-missions is considered a major reason to the successful result in this case.

Recommendations concerning guidelines for Captains/Shipping Companies in connection with SAR-missions.

- Guidelines specifying the Captains obligations and conditions of responsibility, when requested to participate in SAR-missions by MRCC, in accordance with the Ship Safety Act, The Maritime Law and the Swedish Rescue Services Act shall be established. The guidelines shall be worked out in co-operation with the Maritime Inspection, the Legal Department and the Maritime Traffic Department of the Swedish Maritime Administration.

FRT (Fire Response Teams)

The Swedish Maritime Administration has established agreements with the Fire Departments in six Swedish communities regarding FRT. These communities have Fire Response Teams, consisting of groups of 6 firemen trained especially in fire-fighting and life-saving onboard ships. Instructions, checklists and training programmes for the FRT teams are continuously worked on and improved in a FRT group consisting of representatives from the Swedish Rescue Service Administration, the Swedish Maritime Administration, the Swedish Coastguard and the six communities involved.

FRT teams are situated in Stockholm, Gothenburg, Karlskrona, Gotland, Helsingborg and Härnösand.

The FRT teams are according to instructions alerted by the MRCC. The FRT team in Gothenburg can also be alerted directly by the Gothenburg Fire Brigade according to a separate agreement. When a FRT team has been alerted a FRT trained co-ordination officer from the Gothenburg Fire Brigade is, according to instructions, to immediately leave for the LCK and assist in the Support Group and act as representative for whatever FRT team that has been activated.

The FRT instruction covers issues such as responsibility / liability, co-ordination, alerting of- and transportation of the teams, equipment and communication. There is also a special checklist to be used by the MRCC when alerting a FRT teams regarding other measures to be taken.

A special fax-form has been made out which is to be filled in when alerting a FRT team.

At an early stage following the distress message from the PR the ARCC were delegated the task of alerting the Gothenburg FRT. This was done at 02.29 and at 02.45 the Stockholm and Helsingborg FRT teams were also alerted.

The ARCC staff-members that were directly involved in this mission and were integrated in the MRCC staff were not aware of the routines for alerting the FRTs. The alerting of the FRTs as well as the alerting of the helicopter crews was conducted from the ARCC where this FRT checklist was not available. In this case the ARCC called SOS Alarm who in there

turn alerted the FRTs. The FRT co-ordination officer was not directly requested, instead it was on the Fire Brigades own initiative that he was sent to the LCK.

According to the FRT checklist a fax message is to be sent with relevant information to the community whose FRT has been alerted as a complement to the actual alert. These faxes were never sent in this case.

The FRTs were initially alerted for the purpose of assisting PRs crew in searching through the vessel. This instruction was however changed before the first FRT boarded the PR, and they were instead instructed to assist the crew in keeping the engine-room under control. The fire was at this point extinguished though there was still an immense heat in the vicinity of the engine-room.

The passengers had been evacuated and preparations were been made for towing the PR in to Gothenburg. There was however still a danger for the remaining crewmembers as well as a few passengers that had chosen not to be evacuated.

The FRTs were therefore used for life-saving purposes in this mission and even continued with fire-fighting assistance a long time after that the PR was docked alongside in Gothenburg.

The SMC intended to hand over responsibility of the mission to the local Fire Brigade at 09.45. At this point it was discovered that the passenger-count from the PR differed with the amount of passengers accounted for at the reception point, and the hand-over of the mission was therefore postponed.

The SAR-log does not show if an official hand-over of the operation took place at a later stage.

This means that the FRTs continued their efforts onboard the PR even after the PR was berthed at 12.55 until 16.30. The authorities involved i.e. the MRCC, the Gothenburg Fire Brigade, the Police, the Medical Services, the Port of Gothenburg and the shipping company should have discussed the situation and decided on who was to be responsible for the continuation of the mission.

All of the FRTs have also reported problems with their radio communication onboard the PR.

Those FRTs that were onboard the PR have stated in their reports that the ships own crew functioned well. The use of the ships CO2 system and the fire-fighting steps taken onboard contributed greatly to the successful outcome of the mission, which may very well in other case have developed into a tragic accident.

FRT Helsingborg

According to the MRCC records the Helsingborg FRT was alerted at 02.45. 24 minutes later, at 03.09, the team reported that they were on their way to Berga fire station in Helsingborg, where they arrived at 03.17, to await further transport by helicopter.

According to the report from the Helsingborg Fire Brigade SOS Alarm alerted them at 03.01. This means that it took 16 minutes from the time SOS Alarm was instructed by MRCC to alert the FRT until the alert actually reached the Helsingborg Fire Brigade.

The FRT consisted of seven instead of the usual six firemen. None of the firemen were taken out of the team, the entire group of seven embarked the helicopter. This was explained in that the FRT was at first instructed to exclude the Fire Engineer from the team, and afterwards again requested to include the Fire Engineer by the MRCC. Instead of following the FRT instructions the team was therefore increased by one person, which created problems in stowing the FRT and their equipment in the helicopter.

At 04.20 the helicopter arrived at Berga fire station, loaded the team and their equipment during 26 minutes, and finally lifted at 04.46 according to the MRCC records. The FRT was first flown out to the PR but on arrival immediately diverted to Säve helicopter base outside Gothenburg where they were to put to wait as backup FRT. At 08.30 they were put onboard the PR to relieve an earlier FRT.

According to the report from the Helsingborg Fire Brigade the helicopter lifted at 04.20 from the fire station, a remarkable difference (26 minutes) from the time given in the MRCC records. Disregarding this difference in the reported times of departure for the helicopter, fact remains that it took approximately 2 hours between the time of alert and time of departure with the FRT for the helicopter and an additional 50 minutes before the team were on the scene and ready to be put to use. This is considered a remarkable lapse of time.

The Fire Engineer of the Helsingborg FRT lacked the basic FRT training that is a minimum requirement for any member of a FRT. A Fire Engineer is required to have both basic- as well as officer training in FRT, especially an Engineer.

If a Fire Brigade is unable to comply with these requirements they are expected to report this deviation from the stipulated instructions to the Swedish Maritime Administration.

The problems in having more than six persons in a FRT has been discussed when negotiating the FRT agreement and in was decided then that a FRT should not consist of more than six persons. This incident evidently proves this point. When the Helsingborg FRT were lowered onboard the PR there was no crewmember to meet them, the Fire Engineer therefore went to the bridge where he met the Fire Engineer of the Gothenburg FRT.

The Swedish Maritime Administration has emphasised in the FRT training-courses that the Fire Engineer in a FRT does not necessarily have to be positioned on the bridge. They are instead meant to assist the ships own fire-fighting team as soon as possible. In this case the FRT could have been put to use earlier if a ship officer had met and briefed them directly.

According to the Helsingborg FRT they handed over their responsibilities at 15.00 to their colleagues from Gothenburg, the vessel was at this time alongside. Their records show that the rescue-operation officially ceased at 16.30, though they continued to work until 17.30.

FRT Gothenburg

The Gothenburg Fire Brigade was alerted indirectly by MRCC via SOS Alarm at 02.29. SOS Alarm transferred the call from the MRCC to the Fire Brigades own Alarm Centre (AC) who in there turn alerted two FRTs and requested them to proceed to Säve Helicopter Base, in accordance with the community's alert-plan. At 02.47, after that the Helsingborg and Stockholm FRTs had been alerted, the on duty Fire Chief was alerted. At no time did the MRCC actually request that the Fire Chief should be alerted to the LCK to function as a member of the Support Group.

The Gothenburg FRTs consisted of teams from the Frölunda and Kortedala fire stations. At 03.02 the Frölunda FRT arrived at Säve Helicopter Base for further transport by helicopter and at 03.38 they were landed onboard

ms Stena Danica. After another 45 minutes an attempt was made to board the team on the PR via the stern ramp, but failed.

At approximately 04.50 they succeeded embarking the PR via a bunker door on her starboard side. It subsequently took almost two and a half hours from the time of the initial distress call until a FRT was able to board the PR and offer their assistance.

At 04.15 PR had informed MRCC that all passengers had been evacuated and that the crew and six truck-drivers (that had chosen not to be evacuated) were still onboard.

When considering and evaluating this aspect of time, one must bear in mind that the incident occurred in a position close to both a FRT community as well as a helicopter base with SAR readiness.

A FRT officer (Fire Engineer) was fetched together with the Kortedala FRT from Säve Helicopter Base by a Danish helicopter after that they had landed a Danish FRT onboard ms Stena Danica. The Kortedala FRT including the Fire Engineer managed to board the PR shortly after the Frölunda team, by this time the Danish FRT were also onboard.

The Kortedala FRT was unable to be flown out with the other helicopter stationed at Säve as the second helicopter crew had not yet arrived. When this crew did arrive they insisted on waiting for a medical team to join them and refused to leave without them. The Danish helicopter was therefore used instead. The MRCC SMC had not requested that a medical team should be included in the second helicopter.

The two Gothenburg FRTs were relieved by a Norwegian team of fire-fighters from Larvik and later even by the Danish FRT from Fredrikshamn. Under the supervision of the Fire Engineer from Gothenburg these teams continued until 08.00 when the decision was made to tow the PR in to Gothenburg. A Fire Engineer from Helsingborg supervised the following FRTs.

The FRTs kept in touch with their own organisations both through the Fire Chief of the Support Group at LCK and through their Fire Chief at the alarm-centre in the Gårda fire-station. The report from the Gothenburg Fire Brigade confirms that the fire was extinguished when the first FRT reached the PR.

The MRCC SMC must decide on for which purpose the FRTs are to be used. The SMC can very well consult the Fire Chief and the Maritime Inspector in making this decision. After the initial life-saving phase of the operation it should proceed in a second phase, as ”salvage of property” in, for instance, the interest of the shipping company. The operation could also have been classified as an ordinary fire-fighting mission in the interest of the City of Gothenburg once the PR was towed within the limits of the city’s port. The Gothenburg Fire Department ended their participation in this operation at 17.00.

MRCC`s documentation shows that the responsibility of the mission was never handed over to the Gothenburg Fire Department. MRCC closed the case at 20.00, 7 hours after that PR was docked alongside in Gothenburg. This is explained by the fact that the passenger-counts between the PR and the assembly point differed by approximately 100 persons.

FRT Stockholm

MRCC alerted Stockholm’s Fire Brigade at 02.45 and two FRTs were sent to Berga Helicopter Base for transport by helicopter to Gothenburg. At 03.05 the helicopter pilot informed MRCC that a medical-team also was on its way to Berga.

At 04.28, 1 hour 45 minutes after the first alert, the first FRT left Berga for Säve Helicopter Base where they were put as a back-up team together with the Helsingborg FRT. At 08.25 this team boarded the PR to relieve the Norwegian fire-fighting team.

The second FRT from Stockholm was delayed two hours seeing their helicopter was ordered to pick up a medical-team at Huddinge Hospital outside Stockholm. Judging from available records, the medical-team was alerted by staff at Berga Helicopter Base.

Extra medical staff was alerted following an agreement between the first-pilot and the Flight Commander at Berga. *This was their own decision.*

At 04.55 the second Berga helicopter informed that they had left Berga to fetch a medical-team at Huddinge Hospital. At 05.04 MRCC informed the helicopter that their assistance was no longer required in Gothenburg.

The Stockholm Fire Brigade has also mentioned that radio-communication between the team did not function satisfactorily when onboard the PR.

FRT Larvik (Norway)

MRCC Stavanger alerted Larviks Fire Brigade at 02.45. 45 minutes later a six man FRT were equipped and ready for helicopter transport to the scene. At 03.40 the team was picked up by helicopter and at 05.12 they were landed on a merchant vessel in the area.

By this time the fire was extinguished and the passengers evacuated. The team was given the task of extinguishing glow and cooling the ship together with FRTs from Gothenburg, Helsingborg and Fredrikshamn under the supervision of a Fire Engineer from the Gothenburg Fire Brigade.

Radio communication between team-members did not function when they were on separate decks.

The team were back in Larvik at 14.00, the PR had by this time been alongside in Gothenburg several hours.

Recommendations regarding FRT.

- The SMC at MRCC is to decide which resources are to accompany the helicopters used in a SAR-mission. (According to the agreement established between the Swedish Maritime Administration and the Swedish Military Forces.) The helicopter-crew shall not take onboard and transport any additional personnel besides the crew without prior consultation and clearance from the SMC.

- In case uncertainty arises as to who is to decide where to tow a disabled vessel *during the course of a SAR-mission*, procedures should be drawn up stating channels of contact and responsibilities of decision between the Shipping Company, the Maritime Inspection, the SMC and Port Authorities.

- In one mission-report the question of neighbouring countries Fire Response Teams organisation is mentioned.

At a [7]NORDRED conference in Kuopio, Finland in 1996, the issue of a Nordic Fire Response Team collaboration was discussed within a working-group, which resulted in recommendations for the continuation of this co-operation. The issue has also been discussed in the Swedish Fire Response Team Co-ordination Group. The Swedish Rescue-Service Administration has been suggested to bring up the issue with our neighbouring countries within NORDRED to further develop methodology and instructions.

- The proximity of a Fire Response Team station and/or of a helicopter base with SAR-readiness should be taken into consideration, when deciding on the use of a Fire Response Team in a SAR-mission. In the case of m/s Prinsesse Ragnhild it took 2 hours and 20 minutes before the Fire Response Team was onboard the disabled vessel, despite the nearness to both a Fire Response Team station and a helicopter base with SAR-readiness, which must be considered remarkable. This fact requires further attention and investigation.

- In the instructions for the Fire Response Teams, established in co-operation between all Fire Response Team stations, means of communication and frequencies have been designated for the purpose of communication between Teams. As the communication failed in this SAR-mission this issue should be further discussed within the Swedish Fire Response Team Co-ordination Group.

- There must be no question for the Fire Response Team on the purpose of the mission or on whom the responsibility of the mission lies. In this case there was uncertainty over whether the Fire Response Teams were involved in life-saving or salvage of property. If the primary task is to save lives, it must be clearly notified by the SMC when this task is considered to be over. Information/instructions regarding this aspect shall be established for the SMC as well as for the Fire Response Teams.

[7] Nordred – A Scandinavian Committee of experts involved in Rescue-Services in general.

On Scene Co-ordinator (OSC)

In SAR-missions involving several SAR-units the SMC may find it necessary to appoint a person on the scene to co-ordinate the units. This function is called an On Scene Co-ordinator, OSC.

The Swedish sea area is divided into 12 subdivisions and in every subdivision the Swedish Maritime Administration has trained and appointed pilots as OSCs. There is at least one OSC on duty 24 hours in every subdivision who the SMC can alert and use as his right hand on the scene of an accident.

The OSC chooses which SAR-unit he wishes to use as a platform to operate from depending on the facilities of the units i.e. the kind of accident, the units crew, working and chart space, communication-equipment etc.

When a SAR-mission involving a merchant vessel is initiated and/or distress status has been declared, information is automatically sent to the on-duty OSC via minicall-text (beeper).

In this case the incident occurred in the Kattegatt subdivision. In the SAR-log at MRCC it was however first logged in the Skagerrak subdivision and the on-duty OSC for this area was therefore alerted automatically.

The Kattegatt OSC was instead alerted by Gothenburg VTS who had also acknowledged PRs distress call on VHF channel 16.

The on-duty OSC was at the pilot station on Vinga Island in the Gothenburg archipelago, together with another OSC-trained pilot, when he received the alert. He immediately contacted MRCC and was appointed OSC in this case. He chose a pilot-boat as a platform, pilot-boat 739, where a boatman assisted him. The OSC has later reported that the pilot-boat functioned satisfactorily as a platform throughout the SAR-mission.

When the OSC arrived on the scene the evacuation had already started. As additional merchant vessels and SAR-units arrived to offer assistance they were appointed tasks by the OSC. The tasks consisted of towing liferafts, transporting personnel and collecting emptied liferafts to avoid searching through them several times.

The OSC, amongst others, has mentioned that he found the numerous helicopters hovering around the PR annoying. This fact has been noted on several occasions, amongst others during SAR-exercises. Once the helicopters have performed their task they should be instructed to land and await further orders.

Alternative means of transporting FRTs to the scene has been discussed following this mission.

The OSC decided in agreement with the MRCC SMC that FRTs should be landed on another passenger-ferry in the area seeing the PR did not have a helicopter landing area.

An alternative would have been to lower them by winch onboard the PR, on her helicopter pick-up area.

A Danish helicopter damaged one of its rotor-blades when lifting from a vessel it had landed on, despite the OSC`s recommendation not to attempt a landing. The helicopter was subsequently forced to emergency land on Vinga Island.

Certain surface-units have criticised MRCC for being too involved in details on the scene, which has created uncertainty as to the OSCs task and authorities in the mission. Apart from this the use of an OSC seems to have functioned well in general in this case. The OSC has handled communication with the MRCC, surface-units and other vessels by himself. Had the conditions been worse, the workload for the OSC would most probably have been greater and there may have been a need for a platform with a larger crew to handle communication, plot, documentation etc.

The favourable weather, the area where the incident occurred in the proximity of the Gothenburg archipelago, experience gained from prior exercises, knowledge of the available SAR-units as well as geographical knowledge is sure to have helped the OSC considerably in his task.

In a mission involving several helicopters operating on, and in the vicinity of the scene an ACO (Aircraft Co-Ordinator) should be appointed to insure flight-safety and to divide the various tasks to the SAR flying units. Radio communication is bound to be highly intensive if the same channel is used for both flight- and surface-units.

Records show that one of the Swedish helicopters was requested by ARCC to act as ACO at an early stage in the mission. The helicopter however felt that there was no need for an ACO at this stage and therefore declined the request. At this point there were still only a few helicopters involved. Reports from the surface-units as well as the Norwegian report show that they found the co-ordination of the helicopters as somewhat chaotic and that "someone besides the OSC was co-ordinating them". An ACO was eventually appointed at a later stage in the mission.

It is important to point out that it is up to the SMC or someone directly appointed by the SMC, in agreement with the OSC and the helicopter pilots to decide if there is a need for an ACO or not.

Recommendations concerning the OSC function.

- The co-operation between the SMC and the OSC-Pilots shall be subject to further practice and improved to eliminate misunderstandings on the responsibilities and tasks of the parties when an OSC is involved in a SAR-mission.
- The OSC-Pilots shall be informed, instructed and trained in co-operating with an ACO-function.
- The OSC-Pilots should be informed on the importance of choosing the most suitable SRU to be used as "platform" for the OSC-function.

The Helicopters and their involvement

A total of 13 helicopters were involved in the mission, 8 Swedish, 3 Danish and 2 Norwegian. During the course of the mission 4 helicopters were called back, 2 at an early stage and 2 somewhat later.

The main tasks for the helicopters primarily consisted of transporting FRTs to the scene and evacuating injured/sick passengers as well as passengers suffering from smoke-inhalation. The Swedish helicopter Y70 was appointed ACO at a later stage in the mission.

Säve Helicopter Base The first alert was received at 02.25 and helicopter Y67 was activated at Säve. Y67 lifted at 03.26 with a FRT and a medical-team. After dropping off the FRT onboard the ms Stena Danica Y67 transported a heart-patient to Östra Hospital where the patient later passed away. At 02.55 helicopter Y70 at

Säve is alerted and at 03.13 an extra medical-team from Mölndal Hospital is alerted. Not until 04.35 is Y70 able to depart from Säve. Y70 is later appointed ACO.

Ronneby Helicopter Base

At 02.45 helicopters H96 and Y76 were alerted at Ronneby. H 96 was sent to Helsingborg to pick up a FRT and departed from Ronneby at 03.35 without a medical-team. They arrived in Helsingborg at 04.20 and left again at 04.46 with the FRT. On arrival at the scene they were diverted to Säve Helicopter Base where the FRT was placed in standby as relieving team. At 08.30 this team was again transported to the PR to relieve another FRT. Y76 left Ronneby for Säve at 04.50 but was shortly afterwards called back as their assistance no longer was necessary and landed at Ronneby again at 05.30.

Berga Helicopter Base (Stockholm)

Helicopter Y73 was alerted at Berga at 02.45 and departed at 04.28 with a FRT and medical-team, 1 hour 43 minutes after the initial alert, a considerable lapse of time in these circumstances. On arrival at Säve the helicopter and its FRT were put in standby until 08.25 when they continued out to the scene and the FRT were put onboard the PR to relieve a prior team. Helicopter Y69 was alerted at 03.40 and departed from Berga at 04.55 for Huddinge Hospital to pick up a medical-team. At 05.04 Y69 was informed that their services no longer were required.

The Norwegian and Danish helicopters.

At 02.36 RCC Stavanger offered MRCC Gothenburg the welcomed assistance of 2 Norwegian helicopters. One of them picked up a FRT in Larvik (Norway) at 03.40 that boarded the PR at 05.12. At 03.06 ARCC Karup (Denmark) informed MRCC Gothenburg that 2 Danish helicopters were under way and an additional helicopter was put in standby in Aalborg. The Danish FRT from Fredrikshamn boarded the PR at approximately 05.00. One of the Danish helicopters was used to pick up the FRT from the Kortedala fire-station (Gothenburg) at Säve Helicopter Base seeing the Swedish helicopter Y70 was not yet ready for take-off.

Regarding the helicopter-involvement as a whole, it can be established that the time-lapse from the initial alert to the time for the actual take-off with FRT and medical-team was considerable.

It can also be concluded that far too many helicopters were in the area surrounding the PR at the same time. Several surface-units as well as the OSC have reported that they found the helicopters hovering and flying directly above the life-rafts, surface-units and other vessels without an apparent reason as disturbing. This disturbance created difficulty in both radio- and verbal communication owing to the noise from the helicopters. The wind from the helicopter-rotors also caused the life-rafts to drift and created difficulties for the surface-units involved in the task of evacuating the passengers from these.

A Danish helicopter damaged a rotor-blade when lifting from the ms Stena Danica and was forced to emergency-land on Vinga Island.

The SAR-log at MRCC shows for instance that not less than 7 helicopters were active in the immediate vicinity of PR at 05.15. A schematic sketch over the area is attached to this report to show the activity at this point of time in the mission.

Recommendations on the use of helicopters involved in SAR-missions.

- Helicopter-crews, the medical organisations and responsible authorities shall be informed of the fact that it is the SMC, in accordance with the Swedish Rescue Services Act, who decides which personnel and equipment is to be taken in the helicopters used in a SAR-mission. *(See recommendations concerning Fire Response Team*).

- The ACO-function shall be improved and the co-operation between SMC, ACO and OSC practised.

- Helicopters engaged in a SAR-mission, but without a specific task, shall not be airborne on the scene, but should rather, when practically possible, be landed in the vicinity. Information/instructions regarding this issue should be established within further development of the ACO-function.

Reception-point, Assembly point, Registration of evacuated passengers

At 03.06 the SMC and his staff decide to establish two reception-points within the MKV grounds, one for vessels in the military harbour and one

for helicopters on the lawn. An assembly-point is established for registering the evacuated passengers. A most positive contribution was that the passengers were offered both breakfast and lunch by the MKV. The reception-points as well as the assembly-point functioned most satisfactorily and the police's effort of registering the passengers was commendable.

It took a remarkable time before the passenger-count from the PR agreed with the passenger-count from the assembly-point. Not until 20.13 was this difference accounted for and SAR-case no. 529 could officially be closed at 20.44.

Recommendations concerning the Assembly Point.

- Considering the problems encountered with identification and keeping count of the passengers involved in major SAR-missions, the SMC should, as far as possible, avoid establishing more than one assembly point.

Public Relations

At 03.13 MRCC made several calls to directors at the Swedish Maritime Administration, amongst others to the Public Relations Director Håkan Johansson who however was on vacation. As it is of utmost importance that the press is given correct information at the right moment it would have been desirable for the PR Directors telephone to be redirected to his substitute during his vacation.

It was also discovered that the telephone number to the PR Director was not correct in the speed-dial at the MRCC.

Two press releases were issued by the MRCC. Both contained overall and correct information on the course of events. It should also be mentioned that the Swedish Life-boat Association, one of the major actors in the mission, have expressed their disapproval over the way the mission has been described in the press.

Recommendation regarding public relations in SAR-missions.

- Routines for public relations in connection with SAR-missions are to be established by the Department of Public-relations at the Swedish Maritime Administration.

Ms Prinsesse Ragnhilds berth

At early stage a suitable berth for the PR was discussed between the Director for Traffic-Area Kattegatt, the Gothenburg Port Captain, the Gothenburg Fire Brigade, the Swedish Maritime Inspection and representatives from the DFDS Shipping Company and it was at first decided to tow her to Fredrikshamn, Denmark which was later changed to Gothenburg. DFDS was involved seeing it was finally decided to use their usual berth in Gothenburg, berth nr. 601.

The discussion mainly focused on the safety precautions involved in towing a fire-hazardous vessel into an area with the potential risk of the fire spreading to the surroundings. A berth at Arendal (within the Port of Gothenburg) was first considered. Here however, there was no facility to lower the PRs ramp and discharge the vehicles onboard. The vehicles themselves with their petrol and diesel were also an obvious risk for a spreading of the fire. It was therefore decided to use berth nr. 601 after first moving a tanker from a nearby berth.

Judging from the reports concerning this matter one can detect a certain disagreement, depending on the different interests from the parties involved. These differences of opinion have also delayed the decision of berth in this mission. This delay may have caused a problem had it been worse weather on the occasion, this however was not the case in this event.

Recommendation regarding the choice of berth for a hazardous disabled-vessel.

- In major SAR-exercises this aspect should be considered and practised.

- Contacts with other ports in the area should be made at an early stage.

Medical-teams

A plan has been established in the Western Götaland Region (a region stretching from Gothenburg up to the Norwegian border) in midyear 1999

concerning the alerting and staffing of a medical co-ordination group in the case of a major accident or catastrophe.

SOS Alarm has been instructed to alert the regional Medical Doctor and Medical Official on-duty on request from a co-ordinating authority (in this case the MRCC) or in case of an accident involving more than five injuries.

A medical team from Sahlgrenska Hospital (Gothenburg) accompanied the first helicopter from Säve Helicopter Base on the request from the pilot and after that he had received approval from the MRCC. It was soon evident to the medical-team that the amount of injured passengers was small. This team treated the only passenger that was later the single casualty in the mission. The patient was an elderly woman who suffered a heart failure in connection with the evacuation. The team managed to revive her heartbeat and she was flown by helicopter to Östra Hospital (Gothenburg) where she finally passed away. The Support-Group at the MRCC decided on MKV as assembly point and Doctors, 2 Nurses and several ambulances were called in. An extra medical-team and ambulances were sent to berth nr. 601 when the PR arrived in port. 14 injuries including the deceased woman were treated. What was not foreseen was that the medical assistance that was actually required was mainly that of providing elderly passengers with medicine they had left behind when evacuating the PR.

The second helicopter from Säve Helicopter Base awaited a medical team at the base, which was not requested from the MRCC. This fact, amongst others, delayed the helicopter to such an extent that the Danish helicopter had to be used to transport the FRT from Kortedala fire-station from Säve. The two helicopters from Berga Helicopter Base also awaited medical-teams before departing, this was neither requested from the MRCC. The first helicopter carried both FRT and medical-team though there was no delay involved in this. The second helicopter, on the other hand, flew to Huddinge Hospital to pick up a medical team on their own accord. This is clearly in contrast to the agreement established between the Swedish Maritime Administration and the Swedish Defence Force.

The issue of medical-teams and their involvement in SAR-missions at sea, especially in combination with the use of helicopters, has been discussed many times on different occasions. It should be emphasised that, when it comes to SAR-missions at sea, it is always the SMC who decides whether medical-teams are to be used or not. The SMC must decide whether the

time it takes for a medical-team to be gathered is relevant and called for in relation to the medical assistance required in every SAR-mission.

Recommendation concerning medical assistance in SAR-missions.

- Plain instructions shall be made out for the SMC, the Medical Authorities and other authorities and organisations involved in SAR-organisation, regarding the participation of medical teams in SAR-missions. It should furthermore be controlled that these directives are subsequently followed.

- List of Records

1. SAR-log
2. Report of the Maritime Proceedings at the Gothenburg District Court
3. Press release from the MRCC 8/7 07.41
4. Press release from the MRCC – invitation to press conference

SAR Reports

1. The on-duty MRCC SMC - Sten Erik Pettersson
2. The on-duty deputy MRCC SMC - Peter Harrysson
3. Sven Blad – Sea Area Kattegatt Pilot
4. Swedish Maritime Administrations SAR-units - Sea Area Kattegatt (Pilot-boats nrs. 567, 735, 739, 721 and the on-duty OSC Pilot)
5. Swedish Maritime Administrations SAR-units - Sea Area Skagerrak (Pilot-boat nr. 742)
6. Swedish Life-boat Association – Rescue-boat Dan Broström
7. Swedish Life-boat Association – Rescue-boat Lars Prytz
8. Swedish Coastguard vessel nr 050 and 483
9. Swedish Coastguard vessel nr 288
10. Swedish Coastguard vessel nr 447
11. Swedish Defence Force helicopter Y67 – Säve
12. Swedish Defence Force helicopter Y69 – Berga
13. Swedish Defence Force helicopter Y70 – Säve
14. Swedish Defence Force helicopter Y73 – Berga
15. Swedish Defence Force helicopter Y96 – Ronneby
16. Swedish Defence Force helicopter Y75 – No available report
17. Swedish Defence Force helicopter Y76 – No available report
18. Swedish Defence Force helicopter H91 – No available report
19. The Styrsö Ferryboat Company
20. Western Götaland Region Police Authority – report pending
21. Swedish Coastguard District West
22. OSC Pilot Henrik Bergdén
23. RCC Stavanger Norway
24. Larvik Fire Brigade
25. Ms Stena Danica
26. Helsingborg Fire Brigade - FRT
27. Ängelholm Fire Brigade

28. The Swedish Lifeboat Association
29. Gothenburg Fire Brigade - FRT
30. Sea Area Skagerrak
31. Medical Authorities – Western Götaland Region
32. Stockholm Fire Brigade - FRT
33. Swedish Defence Force – Marine Commando West
34. Swedish Aeronautical Organisation - ARCC
35. VHF recordings on tape
36. The Berth - Björn Lager / Sea Area Kattegatt
37. Göteborgs Hamn – Kajplats i Göteborg för Prinsesse Ragnhild
38. Extracts from nautical charts

List of Recommendations

Recommendations regarding the management and staff-methodology at MRCC Gothenburg.

- The competence and possibilities of co-operation within the LCK as a whole, as well as the separate functions individually should be further looked into.
- Staff-exercises with the purpose of training and improving staff-methodology and to create routines for forming working-teams. (In accordance with the CT decision 1/98)
- All SMC's shall be trained in handling major SAR-missions and, if necessary, made aware of the specific issues concerning missions of this magnitude.

Recommendations concerning the MRSC-function.

- Routines shall be established so that the MRSC-function can be activated in the best possible way in major SAR-missions. The MRSC is a part of the MRCC staff and shall be utilised efficiently.

This recommendation should be co-ordinated with the recommendations concerning the MRCC.

Recommendations concerning observations from Norway and Denmark.

- In international SAR-exercises or exercises of an international character, the English language shall be used.
- The issue of satisfactory communication-equipment for Fire Response Teams shall be discussed further within the Fire Response Team Co-ordination Group. *(See recommendations concerning Fire Response Team*)

Recommendations concerning communication.

- In major SAR-missions where a large amount of SRUs and an OSC are involved as well as in major SAR-exercises, the SMC shall, if required, designate a working frequency for communication between SRUs and OSC.

- The effects of distributing separate frequencies to air- and surface-units involved in SAR-missions should be further investigated and evaluated.

- Further recommendations concerning communication are listed under "*Recommendations concerning Fire Response Teams*" and "*Recommendations concerning observations from Norway and Denmark"*.

Recommendations to improve the Support-Group function.

- Specific tasks and routines for the Support-Group are to be established in connection with the implementation of the recommendations concerning the MRCC and MRSC functions.

Recommendations concerning guidelines for Captains/Shipping Companies in connection with SAR-missions.

- Guidelines specifying the Captains obligations and conditions of responsibility, when requested to participate in SAR-missions by MRCC, in accordance with the Ship Safety Act, The Maritime Law and the Swedish Rescue Services Act shall be established. The guidelines shall be worked out in co-operation with the Maritime Inspection, the Legal Department and the Maritime Traffic Department of the Swedish Maritime Administration.

Recommendations concerning Fire Response Teams.

- The SMC at MRCC is to decide which resources are to accompany the helicopters used in a SAR-mission. (According to the agreement established between the Swedish Maritime Administration and the Swedish Military Forces.) The helicopter-crew shall not take onboard and transport any additional personnel besides the crew without prior consultation and clearance from the SMC.

- In case uncertainty arises as to who is to decide where to tow a disabled vessel *during the course of a SAR-mission*, procedures should be drawn up stating channels of contact and responsibilities of decision between the Shipping Company, the Maritime Inspection, the SMC and Port Authorities.

- In one mission-report the question of neighbouring countries Fire Response Teams organisation is mentioned.

  At a [8]NORDRED conference in Kuopio, Finland in 1996, the issue of a Nordic Fire Response Team collaboration was discussed within a working-group, which resulted in recommendations for the continuation of this co-operation. The issue has also been discussed in the Swedish Fire Response Team Co-ordination Group. The Swedish Rescue-Service Administration has been suggested to bring up the issue with our neighbouring countries within NORDRED to further develop methodology and instructions.

- The proximity of a Fire Response Team station and/or of a helicopter base with SAR-readiness should be taken into consideration, when deciding on the use of a Fire Response Team in a SAR-mission. In the case of m/s Prinsesse Ragnhild it took 2 hours and 20 minutes before the Fire Response Team was onboard the disabled vessel, despite the nearness to both a Fire Response Team station and a helicopter base with SAR-readiness, which must be considered remarkable. This fact requires further attention and investigation.

- In the instructions for the Fire Response Teams, established in co-operation between all Fire Response Team stations, means of communication and frequencies have been designated for the purpose of communication between Teams. As the communication failed in this SAR-mission this issue should be further discussed within the Swedish Fire Response Team Co-ordination Group.

- There must be no question for the Fire Response Team on the purpose of the mission or on where the responsibility of the mission lies. In this case there was uncertainty over whether the Fire Response Teams were involved in life-saving or salvage of property. If the primary task is to save lives, it must be clearly notified by the SMC when this task is considered to be over. Information/instructions regarding this aspect shall be established for the SMC as well as for the Fire Response Teams.

[8] Nordred – A Scandinavian Committee of experts involved in Rescue-Services in general.

Recommendations concerning the OSC function.

- The co-operation between the SMC and the OSC-Pilots shall be subject to further practice and improved to eliminate misunderstandings on the responsibilities and tasks of the parties when an OSC is involved in a SAR-mission.

- The OSC-Pilots shall be informed, instructed and trained in co-operating with an ACO-function.

- The OSC-Pilots should be informed on the importance of choosing the most suitable SRU to be used as "platform" for the OSC-function.

Recommendations on the use of helicopters involved in SAR-missions.

- Helicopter-crews, the medical organisations and responsible authorities shall be informed of the fact that it is the SMC, in accordance with the Swedish Rescue Services Act, who decides which personnel and equipment is to be taken in the helicopters used in a SAR-mission. *(See recommendations concerning Fire Response Team*).

- The ACO-function shall be improved and the co-operation between SMC, ACO and OSC practised.

- Helicopters engaged in a SAR-mission, but without a specific task, shall not be airborne on the scene, but should rather, when practically possible, be landed in the vicinity. Information/instructions regarding this matter should be established within the improvement of the ACO-function.

Recommendations concerning the Assembly Point.

- Considering the problems encountered with identification and keeping count of the passengers involved in major SAR-missions, the SMC should, as far as possible, avoid establishing more than one assembly point.

Recommendation regarding media-relations in SAR-missions.

- Routines for media-relations in connection with SAR-missions are to be established by the Department of Public Relations at the Swedish Maritime Administration.

Recommendation regarding the choice of berth for a hazardous disabled-vessel.

- In major SAR-exercises this aspect should be considered and practised.

- Contacts with other ports in the area should be made at an early stage.

Recommendation concerning medical assistance in SAR-missions.

- Plain instructions shall be made out for the SMC, the Medical Authorities and other authorities and organisations involved in SAR-organisation, regarding the participation of medical teams in SAR-missions. It should furthermore be controlled that these directives are subsequently followed.

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List of abbreviations:

ACO	Aircraft Co-ordinator
ARCC	Aeronautical Rescue Co-ordination Centre

CMRCC	Head of MRCC
FRT	Fire Response Team
GD	General Decision
JAMRCC	Joint Aeronautical Maritime Rescue Co-ordination Centre
MF	Medium Frequency
MRCC	Maritime Rescue Co-ordination Centre
MRSC	Maritime Rescue Sub Centre
NCW	Naval Command West
PR	Prinsesse Ragnhild
RCC	Rescue Co-ordination Centre
SAR	Search and Rescue
SITREP	Situation Report
SMC	Sar Mission Co-ordinator
SOK	Sörvaernets Operativa Kommando (Danish MRCC)
SRR	Search and Rescue Region
SSRS	Svenska Sällskapet för Räddning af Skeppsbrutne Swedish Lifeboat Association
VHF	Very High Frequency