The proposed research investigates the safety and risk management of the maritime traffic during winter ice season. The research focuses on defining a systematic method which supports the constitution of a safety and risk management models and methodologies for assessing and guiding the safety performance of the winter navigation system. This is done by utilizing several methodologies which suit for the analysis of safety based on system-theory. The produced research is useful for planning, implementing and evaluating of the safety performance of different stakeholders involved in the functioning of the winter navigation system. The research is funded by the Strategic and Operational Risk Management for Winter Maritime Transportation System (STORMWINDS) project (2015-2017).