Background The Finnish Transport Agency is an expert organisation responsible for Finland's roads, railways and waterways and for the overall development of Finland's transport system. FTA operates under the jurisdiction of the Ministry of Transport and Communications. It is FTA's responsibility to maintain the high quality of Finnish infrastructure, which in its turn enables mobility services, robotization and digitalization.

Infra Contractors Association's main mission is to improve their member companies' business. Member companies build and maintain roads, streets, railways, waterways, harbours and airports, parks and sports grounds, pipelines, sewer networks, power-distribution networks, telecommunications network and produce aggregates that are vital for all construction.

Methods The Finnish Transport Agency and Infra Contractors Association work constantly together to improve occupational safety at the infra worksites. The target is to improve occupational safety (norms, instructions and procedures) and the safety management. Both, The Finnish Transport Agency and Infra Contractors Association have different safety competitions and campaigns, which are supporting each other.

Results The newest joint venture is the ''Rail Road Forum''. Its aim is to gather together all who somehow operates in the rail road. The main focus is to develop rail road from different aspects in open co-operation, together. And off course one important sub-group is Safety and Security Group.

This is only one prove of success of what doing together can make.

Conclusions Through the constant cooperation amongst with all the parties it is possible to gain better safety of work.

995 PHYSICAL WORKLOAD OF SEAFARERS DURING EMERGENCY EXERCISE COURSE

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Background Every seafarer must be able to perform both, normal duties and emergency situations on board ship. There are few studies of the physical demands of emergency duties on board ship. The aim of the study was to measure the physical strain during emergency training drill (basic safety training BST), which is mandatory for every seafarer. Some of the maritime emergency tasks (like smoke diving) are much heavier than the emergency duties in basic safety training. Therefore BST tasks form the minimum strain level every seafarer has to perform.

Methods Eighteen firefighting male seafarers and five other female seafarers aged 24–45 were recruited to study. They all attended to physical examination and to fitness tests. Ability to perform 100 metre's swimming in rough sea, climbing ladders up, turning an upturned life raft, and climbing to a life raft from water were tested in a maritime safety training centre. Physical strain of these tasks was assessed by heart rate variability method and by Borg Rating of Perceived Exertion Scale.

Results Results of the heart rate variability show that even in good physical shape the tasks tested are causing strain and load peaks. Swimming was causing the highest strain; the physical load among males was 7.9 (4–11) MET and perceived exertion was 12 (8–14). Climbing ladders up caused the lowest strain 6 (3–9) MET. The average physical load of climbing to a life raft was 7 MET and turning of an upturned life raft was about at the same level. On average, the women strained more than the males.

Conclusions The tasks in simulated rescue training cause short term aerobic strain in controlled environment. In real life settings the emergency tasks are more demanding. Poor aerobic fitness is a risk factor for exhaustion and accidents during emergency situations. This is not only a risk for the safety of the vessel and other crew but it also puts seafarer's own life in danger in emergency situations. Based on these results even the safe rescue training requires at least normal performance capacity. It is however highly important to support the physical rehabilitation and exercise training of the seafarers with decreased fitness, because the appropriate rescue training improves skills and reduces strain. The functional resources to manage rescue activities should be included in health examinations.

996 THE DIFFERENCE OF FEMALE LABOUR'S WORK FATIGUE LEVEL BETWEEN THE MORNING, EVENING, AND NIGHT SHIFTS IN WINDING PT. ISKANDAR INDAH PRINTING TEXTILE SURAKARTA

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Background This research was aimed to know and investigate the difference of female labour's work fatigue level between the morning, evening, and night shifts in winding PT. Iskandar Indah Printing Textile Surakarta.

Methods This research is an observational cross sectional analytical approach, sample were 56 woman in Winding division. Sampling technique uses in this research was purposive sampling by determining the predefined characteristics. The data collection was done by measuring the labour fatigue level using Reaction Timer. The data analysis used statistic non parametric kruskal Wallis by using computer program SPSS 17.00 Version.

Results The result of statistic showed the difference of female labour's work fatigue level between the morning (326,41 ± 79,52), evening (393,32 ± 83,20), and nights shift (483,00 ± 118,66) showed very significance value $p = 0.001$.

Conclusions The highest level of fatigue was night shift. To solved this problems, it could be recommended by giving some nutritions, providing shuttle facilities for female night shift workers and applying rotation shift patern with rota metropolitan (2–2) and rota continental (2–3). Design recommendations: as few night shifts as possible, no more than two to four consecutive night shifts, forward rotation: early-late-night, avoidance of the accumulation of working hours, as far as possible two consecutive days off at the weekend, early shift not to start too early, night shift not to end too late, and predictability of shift schedule.

997 KNOWLEDGE AND PRACTICE OF INJECTION SAFETY AMONG SURGICAL NURSES IN POLAND: AN INTERVENTION STUDY

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Background Medical staff members are exposed to the risk of sharps injuries, which may result in contracting blood-borne infections. The objective of this quasi-experimental pre-test/post-