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ENGLISH

EXAM IN TIØ4201

RISK GOVERNANCE

Friday 14th of December, 2012

Time: 09.00 - 13.00

Support materials:	D	No written and handwritten examination support materials are permitted.

Censorship is due 14th of January, 2013

All tasks count 25 % each for the evaluation of the exam.

Task 1: Risk governance of radio-frequency electromagnetic fields (25%)

Consider the case description below and answer the questions under the text

Electric and magnetic fields are unavoidably produced wherever electricity is used, and are thus inherent in modern societies. One type of electromagnetic fields (EMFs) are radio-frequency EMF. Radio-frequency EMFs is produced by radio/TV broadcasts, microwave ovens, radar, wifi, cellular phones and other technologies. Uses of technologies producing radio-frequency EMF bring enormous benefits to today's societies. Technology generating EMF is relatively new and still developing continually.

With the rapid advances in EMF technologies, people are increasingly exposed to radiation in the radiofrequency range. It has been a rapid growth of exposures over a relatively short time. Radio-frequency fields produced by radio and TV transmitters have been around for decades; it seems likely that if there were a major public-health issue caused by these, some indication of it would have emerged. However, base stations, and other communication infrastructures, and residential exposures such as wireless monitors used in children's cribs, cordless phones and wi-fi are much more recent.

Questions have been raised concerning the health effects of radio-frequency EMF. Long-term effects have mainly been focused on the risk of different types of cancer. Short-term health effects might be on brain electrical activity, cognitive function, sleep, heart rate and blood pressure. Related to mobile cell phones, a short term effect can by heating of the skin and other superficial tissues, which some claim give a temperature rise in the brain or any other organs of the body. However, the scientific evidence of these short-term and long-term effects is disputed.

Possible health effects of radio-frequency EMFs are marked by a lack of scientific knowledge. For radio-frequency EMFs, there are no persuasive data suggesting a health risk, but research and particularly exposure assessment is still immature. Research results for cancer, the most studied outcome, remain controversial. Most reviews conclude that based on current evidence there is no reason for concern. However, a few reach different conclusions. Focusing selectively on positive evidence, they call for an immediate reduction in exposure limits, so far with limited public or political response.

Results from epidemiological studies (studies of the patterns, causes, and effects of health and disease conditions in defined populations) of broadcast radio-frequency EMF or cellular communications infrastructure has been sparse and uninformative. Epidemiological evidence concerning cell phones themselves is, so far, of questionable quality. There have been suggestions of effects, but not from reliable studies.

The invisible and involuntary natures of EMF exposure, its presence in public areas and private homes, and the assumed health outcome of cancer, particularly leukaemia, have all heightened public anxiety. Association with radiation, at least in name, also does not help. Consequently, media coverage has been intense and the issue has been brought to a wide public awareness.

Task 1.1 Emerging systemic risk
Would you consider the risk of radio-frequency electromagnetic fields an emerging systemic risk? Why/why not?

Task 1.2 Risk classification
1) What is understood by complex, uncertain and ambiguous risk?
2) Is the risk related to radio-frequency electromagnetic fields complex, uncertain and/or ambiguous? Give arguments for your answer
3) Based on your answers above – what risk management strategies would you suggest for dealing with the risks of radio-frequency EMF? Exemplify your answer

Task 1.3 Risk governance deficits
Identify risk governance deficits in risk governance of radio-frequency EMF

Task 1.4 Mass media coverage
As stated in the text, the media coverage has been intense. Why has the media been interested in this risk issue? Base your answer on relevant theory

Task 1.5 Looking into the future
If it turns out in 20-30 years that there were health consequences of radio-frequency EMFs – what do you think the critique of current risk governance efforts be?

Task 2: Statements for discussion (25%)

Below you will find four statements about risk/safety issues. Give a pro-con discussion about the "right" answer (agree-disagree), and then argue with what have learned in this course for your own opinion.

2.1. The Norwegian society has never been so safe and secure as today

2.2. Society/government has a duty/obligation to protect everyone against risks - even self-imposed risks

2.3. Too much focus major accident risks in the public debate compared to all single accidents which really count on the fatality statistics

2.4. It is unethical to think of money and costs when saving human lives

Task 3: Testing knowledge and understanding (25%)

3.1 What is risk?

3.2. Give a short description of "social amplification of risk" with a few examples related to techniques applied by mass media for capturing attention.

3.3. What is new and different in resilience engineering compared to traditional risk management approaches? What are the four main abilities in a resilience engineering model?

3.4 What is your understanding of the concept "vulnerability" and how does it relate to traditional risk management and to resilience management?

3.5. Present a list of external actors and stakeholders in regulating a company's risk management

Task 4. Perspectives on accidents (25%)

On October 30 1998 a fire occurred at a disco in Gothenburg, Sweden, The fire led to 63 fatalities and about 200 injured people. The place where the disco was arranged was approved for 150 people, however on the night of the accident about 400 youths were inside.

The fire took place at the third floor were there was a disco arranged to celebrate Halloween. The fire started in a stairway connected to an emergency exit. This implied that only one stairway (the main entrance) was available for evacuation. Many youths jumped out of the windows although these were placed 2,2 meters above the floor and 5 meters above ground. Investigations after the accident show that the fire safety in the building was inadequate.

Pick three perspectives on organizational accidents that you would use to analyze the accident. Why do you select these three? What understandings will the chosen perspectives provide in an accident analysis?

Make assumptions beyond the accident description regarding circumstances and causal factors