

LICENSING OF BASE TRANSMITTER STATIONS (BTS)

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PRESENTATION OUTLINE

- **Radiations From Communication infrastructure**
- **The Effects Of EMR On Human Health**
- **NEMA Role in Risk Management**
 - a. **Meaningful PAP Consultation**
 - b. **NEMA as a risk manager**
 - c. **Comparative Risk Analysis**
 - d. **Precautionary Principle**
 - e. **Environmental Impact Assessment Requirements**

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Radiations From Communication Infrastructure

- **What is EMR, EMF, or RF?**-The term EMF is an abbreviation for Electric, Magnetic and Electromagnetic Fields,
- **EMR is an abbreviation for Electromagnetic Radiation** and RF is Radio Frequency. These terms are often used interchangeably.
- EMR is part of everyday life, emitted by:
 - a. **Natural sources** like the sun, the earth and the ionosphere, as well as
 - b. **Artificial sources:** TV transmission, Microwave telephony radio, transmitters, Mobile phones base stations, Broadcast Transmitters, Remote controls, Electrical and electronic equipment, and AM and FM radio signals.



Is EMR Ionizing?

- EMR is **non-ionizing radiation**. This means that it is not able to directly impact enough energy to a molecule or atom to break chemical bonds or remove electrons.
- **In contrast, ionizing radiation (such as X rays)** can strip electrons from atoms and molecules. This process produces molecular changes that can lead to damage in biological tissues.

What Are The Effects Of EMR On Human Health?

- According to WHO, (following extensive epidemiological studies dating back to 1960s on the Health effects associated with exposure to non-ionizing radiation:
 - a. No clear evidence has been found to suggest that exposure to electromagnetic radiation can cause cancer (WHO fact sheet No. 193, revised June 2000 and fact sheet No. 304 of May 2006).
 - b. Most recent studies find No association for childhood cancer with exposure to electromagnetic radiation
 - c. Results of studies indicating that exposure to RF fields causes or influences cancer are inconclusive
 - d. Although some studies have associated lens defects with microwave radiation exposure, the present view is that low-level chronic exposure to microwave radiation does not induce cataracts in man.

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What Are The Effects Of Emr On Human Health?

- When the human head is exposed to pulsed radiation such as radar, an audible sound described as buzz, chirp, click or knocking sensation is perceived by some individuals; the sound seems to originate within or behind the head a phenomenon called “RF hearing” or “ RF sound” .
- One of the effects of RF is heat due to absorption by the body tissue. However, this does not pose a health risk as the body’s thermo-regulatory process carries that heat away.
- Reports have also been made of symptoms such as nervousness, disturbed sleep and fatigue associated with the use of the mobile phone. However, studies done to prove the significant association between use of the mobile phone and the above-mentioned symptoms remain inconclusive.

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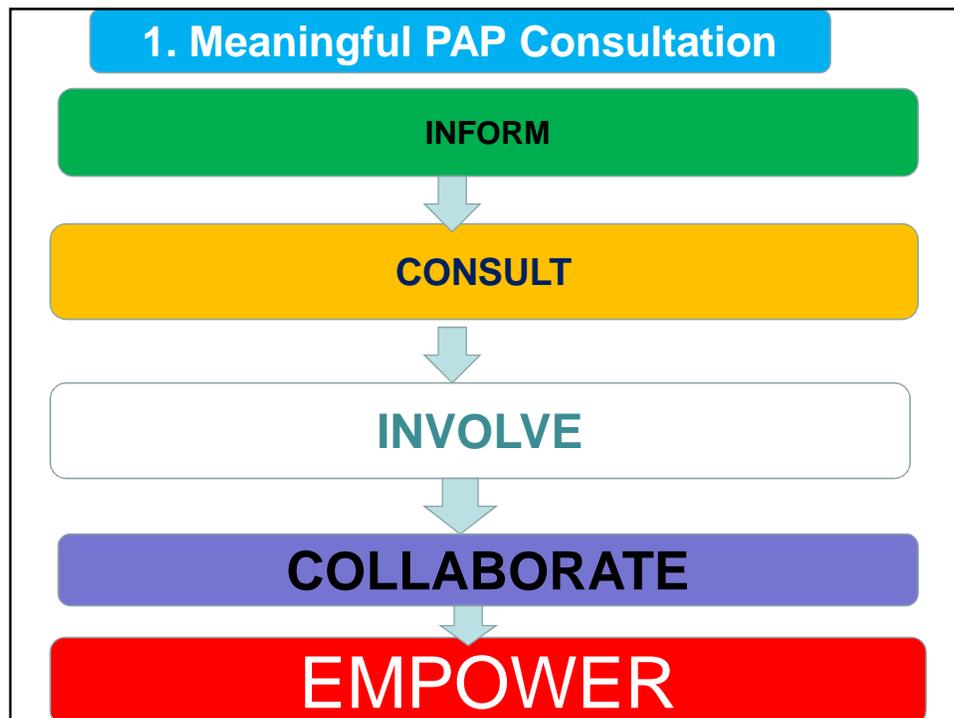


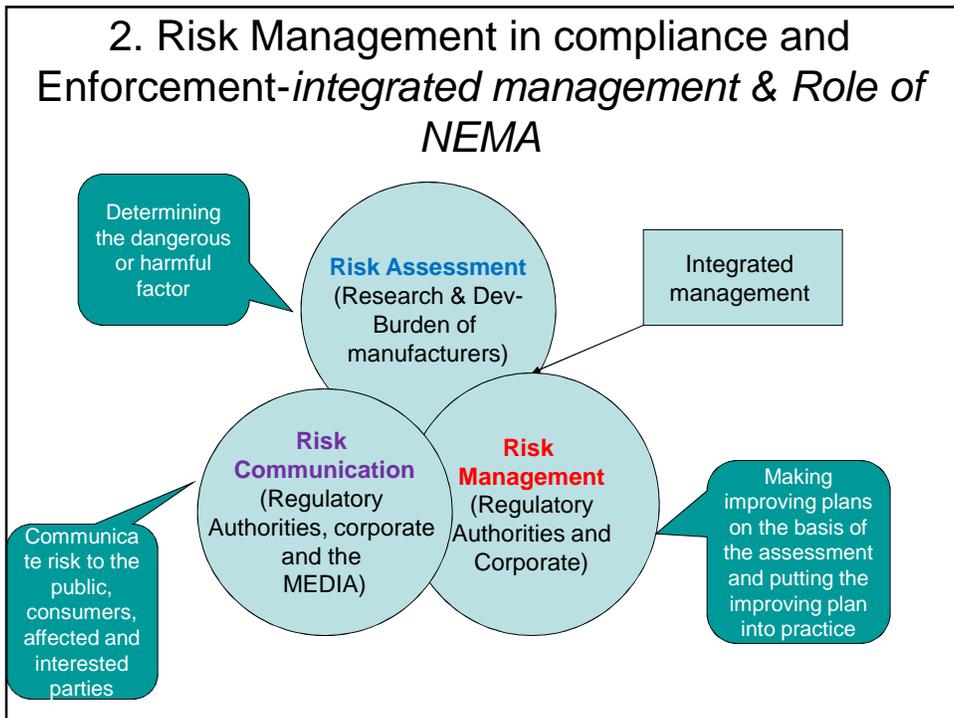
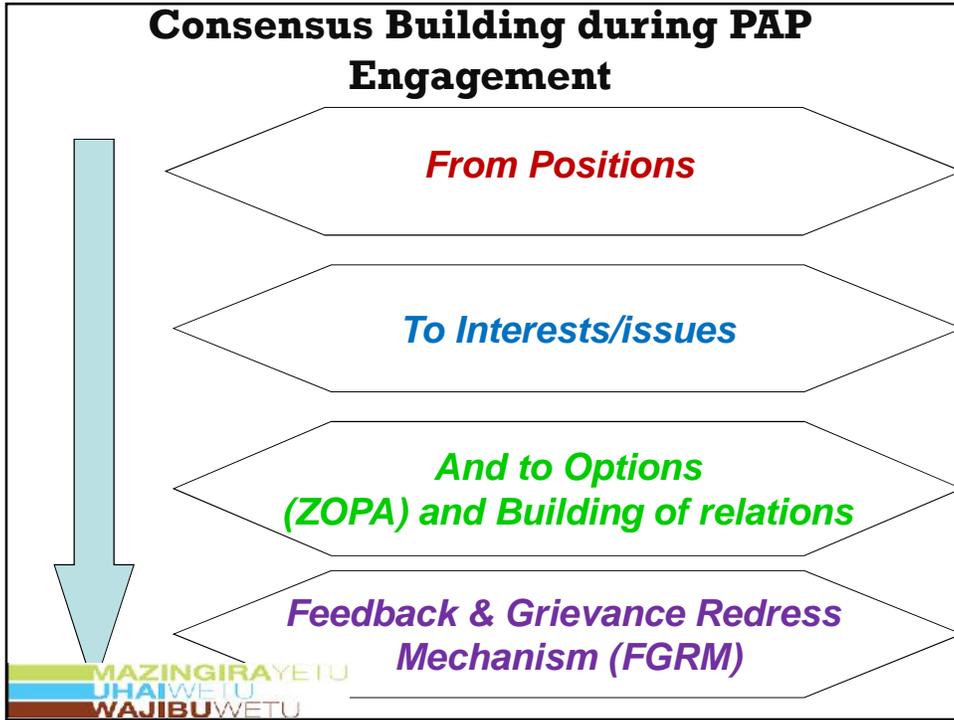
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NEMA Role in Risk Management

1. **Meaningful PAP Consultation:** uplifting the residents/public understanding of the technical and policy issues surrounding the BTS
2. **NEMA as a Risk Manager** has also explained the impossibility of a risk-free environment noting that some of the risks arise from natural sources.
3. **Comparative Risk Analysis-** NEMA therefore prefers the presentation of Comparative Risk Information a useful aid to the public discourse on risk acceptance. This involves the use of statistics on the risks on activities commonly engaged in and exposures that commonly occur
4. **Precautionary Principle** as applicable
5. **Environmental Impact Assessment** Requirements to ensure project is **justified** (environmentally), **Fair** (economically) and **acceptable** (socially).

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3. Comparative Risk Analysis

- While BTS operate at higher powers than do the mobiles, the RF exposures that people get from BTS are typically thousands of times lower than those from the mobile handsets.
- The body absorbs up to five times more of the signal from FM radio and television than from BTS. This is because the frequency used in FM radio (100MHz) and in TV broadcasting (around 300 to 400 MHz) are lower than those employed in mobile telephony (900 and 1800 MHz)
- Furthermore, radio and TV broadcast stations have been in operation for the past 50 or more years without any adverse health consequences being established.

Activity/exposure	Annual risk (deaths per 100, 000 at risk)
Motorcycling	2000
Smoking (all causes)	300
Smoking (cancer)	120
Fire fighting	80
Mining	63
Farming	36
vehicles	24
Fires	2.8
Chlorinated drinking water (chemical by-product)	0.8
4 tbsp peanut butter/day (aflatoxin)	0.8
3 oz charcoal broiled steak/day (<i>nyama choma</i>)	0.5
Floods	0.06
Lightning	0.05
Hit by meteorite	0.000006
Documented Annual Risks of death associated with some activities and exposures	

4. Application of Precautionary Principle as advised by WHO

- The WHO advice on electromagnetic fields and public health with respect to mobile telephones and their BTS (Fact Sheet 193 June 2000) includes the following precautionary measures:
- **Government:** if regulatory authorities have adopted health-based guidelines but, because of public concerns, would like to introduce additional precautionary measures to reduce exposure to RF fields, **they should not undermine the science base of the guidelines** by incorporating arbitrary additional safety factors into the exposure limits. Precautionary measures should be introduced as a separate policy that encourages, through voluntary means, **the reduction of RF fields by equipment manufacturers** and the public.
- **Individuals:** present scientific information does not indicate the need for any special precautions for use of mobile phones. If individuals are concerned, they might choose to limit their own or their children's RF exposure by **limiting the length of calls**, or **using "hands-free" devices** to keep mobile phones away from the head and body.

Environmental Impact Assessment Requirements

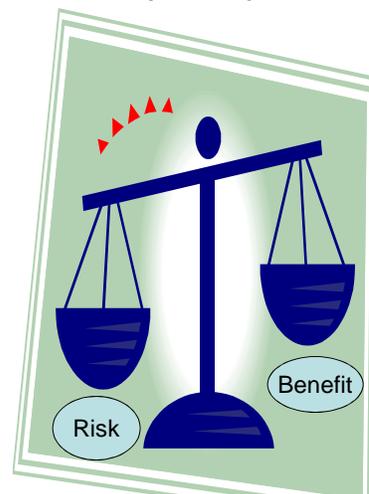
- Comprehensive discussions on **exposure and impacts of EMF** from BTS on public health.
- Adequate **PAP Consultation** with emphasis on **risk communication and full disclosure** of emission impacts so as to address the risk perception, provide public relief, enhance public confidence and acceptability.
- **Adequate site specific baseline information** on surrounding land use and existence of a similar tower in the vicinity.
- **Discussion on structural stability of the tower/mast** and the need for the **setback distance- the fall zone** prescribed as 1.5 times the height of the tower within which no residential or public utility structure should be located.
- **Visual impact** in relation to the background

Environmental Impact Assessment Requirements

- **Analysis of Alternatives;**
 - a. **Co-location** recommended over new establishment
 - b. **Site selection-** sites away from residential areas recommended
 - c. **Greenfield, Roof top and Small-Cell**
 - d. **Lattice tower, Monopole and camouflage** considerations
- Electricity source should be from the National Grid and use of Genset restricted for back up purposes.
- Genset-Prescribe compliance with Noise and Excessive Vibration Pollution Regulation, 2009
- **Occupational Safety-** Fall protection Programme and EMF exposure protection.

Risk Management (RM)

- Describes the process of evaluating alternative regulatory actions and selecting among them-policy action
- RM is carried out by Regulatory agencies under various legislative mandates.
- Its an agency decision-making process that entails consideration of health, environmental, social estimation, economic estimation, policy judgment (political), engineering information and Risk-Benefit control.
- It requires the use of value judgment on issues such as acceptability of risk and the reasonableness of the cost of control
- Note that it is a trademark of environmentally enlightened corporations to also undertake their own management actions.



“Good things always brings bad things”
RM is a balance or a trade-off of Benefit and Risk,