

**Updates Nov,2012**

---

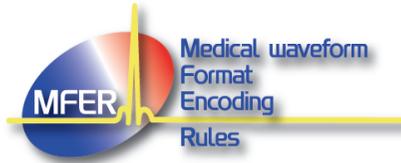
***Masato Tanaka***

***MFER Committee***

## Condition of ISO

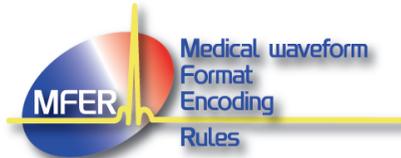
- ISO/TS 11073-92001 -> ISO/IS-22077-1  
**Medical waveform format encoding rules**
- ISO TS11073-92301 -> ISO/TS-22077-2  
**Electrocardiography**
- ISO TS11073-92302 -> ISO/TS-22077-3  
**Long term electrocardiogram**
- ISO TR11073-92206  
**MFER Conversion from SCP-ECG**
- ISO TR11073-92205  
**Physiological observation report based on CDA R2**

**Renumber : 11073-92xxx to 22077-#**



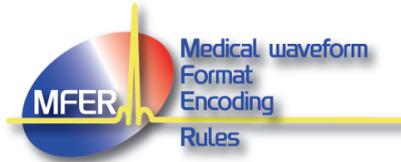
## Main subject

- **MFER was approved as **TS11073-92001 in 2007.** Since 2010 is extended a renewal year, MFER committee intends to obtain **IS.****
- **MFER committee reports the project's progress as necessary. Today's presentation is part of the report. Since operations will be carried according to the voting result of TS, we ask for the understanding and cooperation of you.**



# About MFER (Concept)

- **Simple and Easy Implementation**
  - **MFER consists of simple rules.**
  - **Simplification facilitates understanding, easy installation, trouble shooting and low implementation cost.**
- **Harmonization with Other Standards**
  - **MFER is specialized in Medical Waveform Data.**
    - For encoding information other than medical waveforms, it is suitable to use the HL7, DICOM or IEEE 1073 format, whichever has its forte for the specific non-waveform information.
- **Separation of Waveform Data between Application and Provider**
  - The waveform data provider should make the waveform data as accurately as possible.
  - The application is not required to comply with all of the specifications.



# Type of medical waveform data

## ECG

- **Electrocardiogram (ECG)**
- **12 standard Electrocardiogram (included extended leads)**
- **Electrocardiogram for a long time (Ambulatory ECG)**
- **Stress electrocardiogram (Stress ECG)**
- **Vector cardiogram (VCG)**
- **Deriving inducement electrocardiogram**
- **Intracardiac electrocardiogram and His bundle electrogram**
- **Surface mapping ECG (Mapping ECG)**
- **Late potential Electrocardiogram**

## EEG/EP/EMG

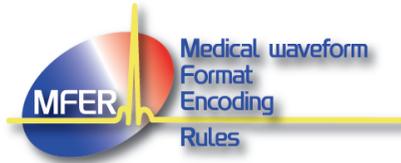
- **Electroencephalograph (EEG)**
- **Sleep electroencephalogram (Sleep EEG)**
- **Electroencephalographs for declaration of brain death**
- **Evoked Potential/Electromyograph (EP/EMG)**

## Monitoring

- **Electrocardiogram (ECG)**
- **ST Segment Electrocardiogram**
- **Continuous Blood pressure**
- **Pulse wave**
- **Respiration**
- **Impedance respiration**
- **Thermistor respiration**
- **Anesthetic and respiration gas**
- **SpO<sub>2</sub>,IBP,NIBP**
- **CO,CO<sub>2</sub>**
- **Temperature**

## Other

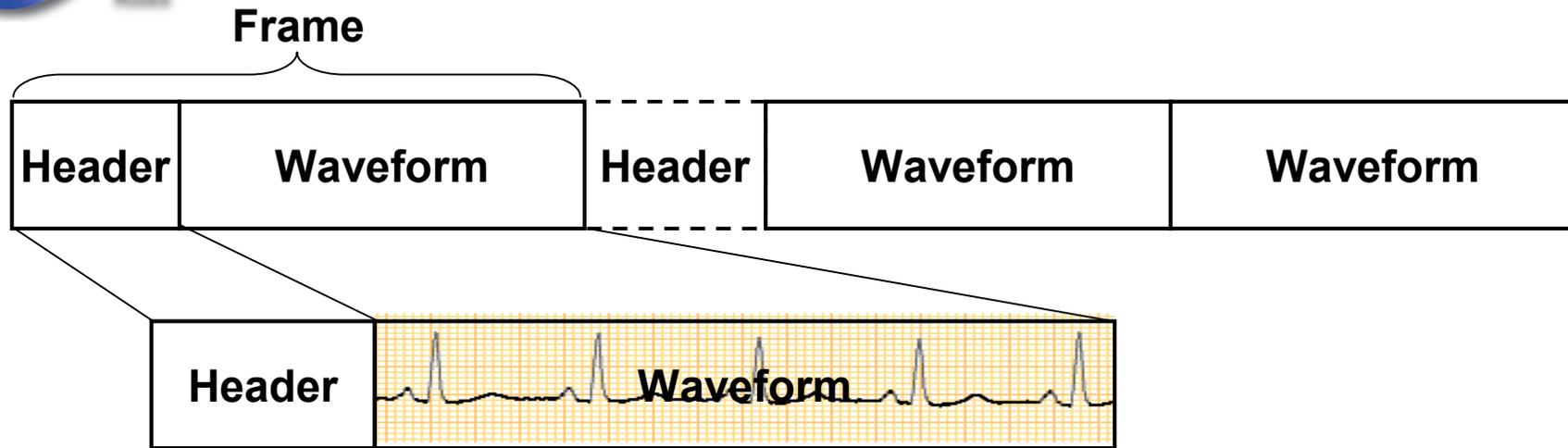
- **Spirometry**
- **Heart sound**
- **EOG**
- **Fetal heart sound**
- **Fetal electrocardiogram**



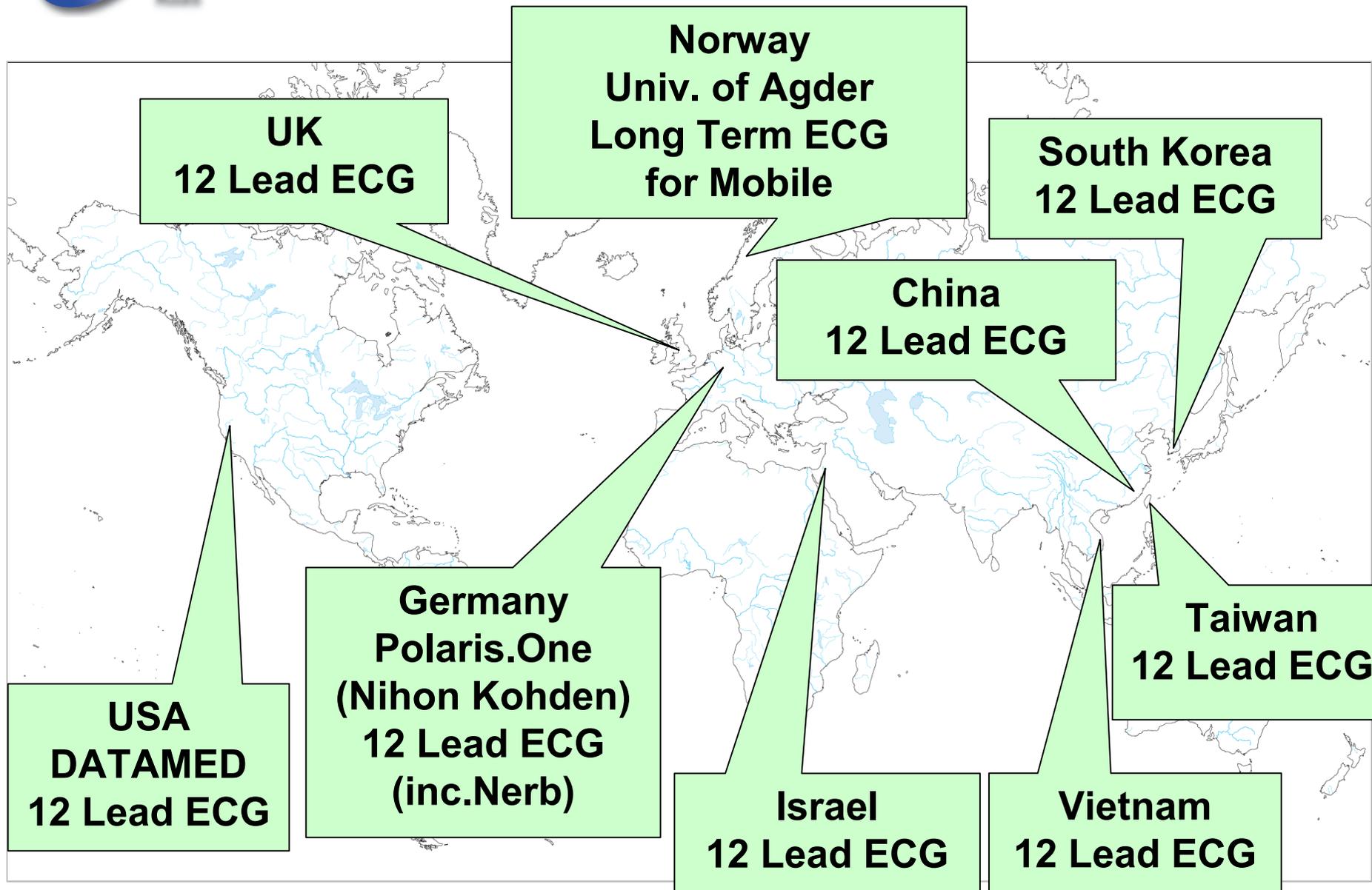
# Background

- **Medical waveform data such as an ECG or an EEG are widely utilized in physiological examinations, physiological research, electronic medical records (EMR), healthcare information and other areas in the clinical field.**
- **Medical waveform data can be used for many medical and research purposes if digital signal processing technology is applied to standardize the data in a digital format.**
- **For medical waveforms it is essential to standardize the data format to expedite the mutual application of the standard so that the data can be processed electronically and used in a variety of ways.**

# MFER description



MFER defines as a gathering on a frame which consist of header and waveform. Header is described with sampling attributes, waveform frame attributes and other supplemental information.



# IHE-J Demonstration

## 12 leads ECG

- IHE-J (National Extension) demo at JAMI as National project.
  - Use case
    - ST depression was occurred when ECG was measured in Ambulance car by Fukuda Denshi
    - ECG was backed to a normal condition when ECG was measured at a Hospital
    - Comparing between two ECGs

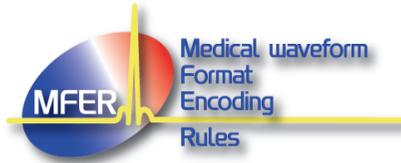


# Use case

**Ambulance car**  
Fukuda denshi ECG



**Hospital**  
Nihon Kohden



## Conclusion

- MFER can describe **all medical waveforms**.
- MFER is very simple and guarantees **interoperability**.
- MFER can be used for **multi purpose** such as EMR, research, database and so on.
- We expect many excellent product, software and tool will be developed for MFER waveforms and many researchers will easily investigate the waveforms and we will contribute to human health.

MFER was approved as TS11073-92001 in 2007. Since 2012 is a extended renewal year, MFER committee intends to obtain IS. we ask for the understanding and cooperation of you.