



Viet Nam
Meteorological and
Hydrological
Administration

WEATHER RADAR BASIC & ROUTINE MAINTENANCE IN VIETNAM



Mr. Do Trung Truc, VNMHA

January, 2024

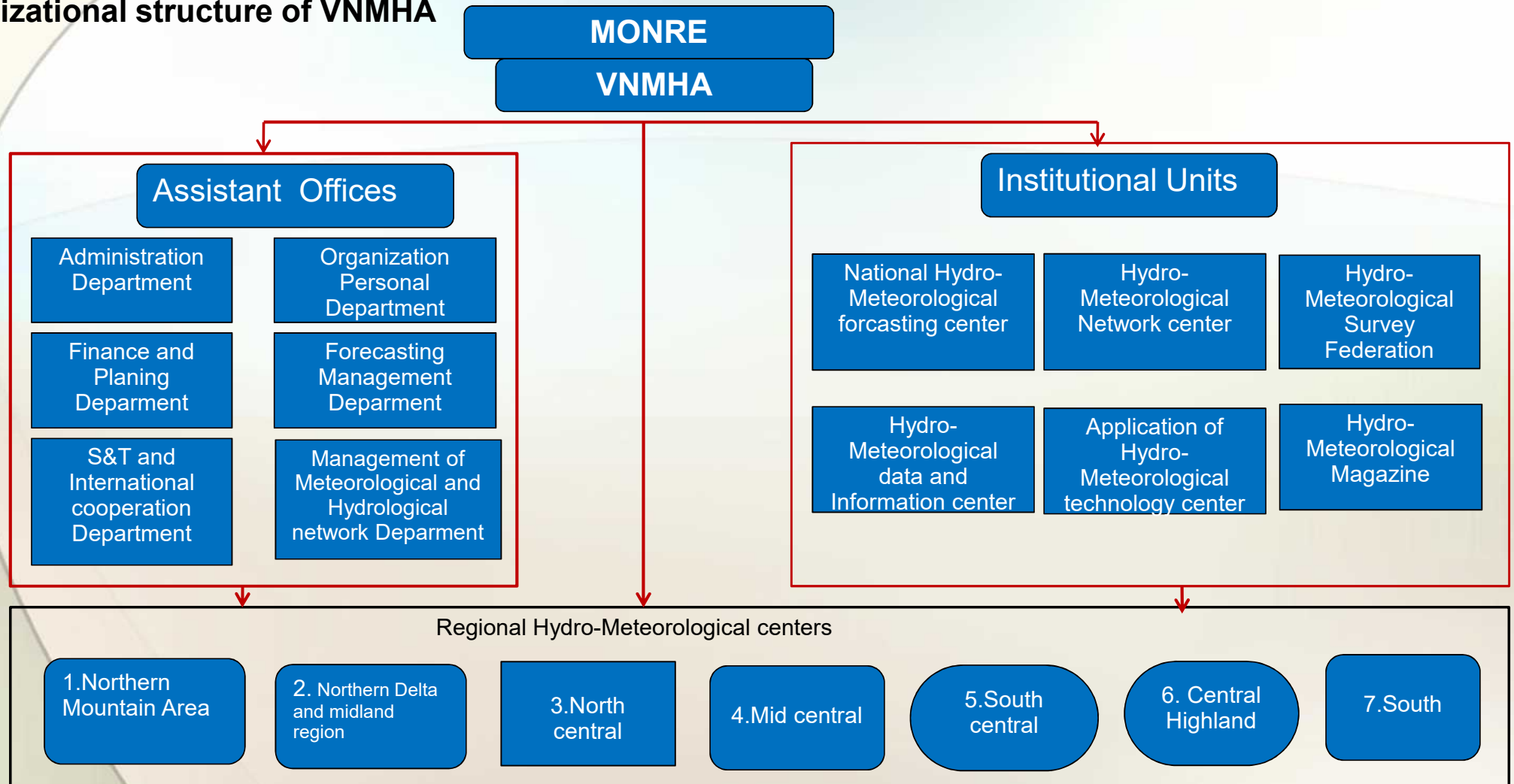


OUTLINE

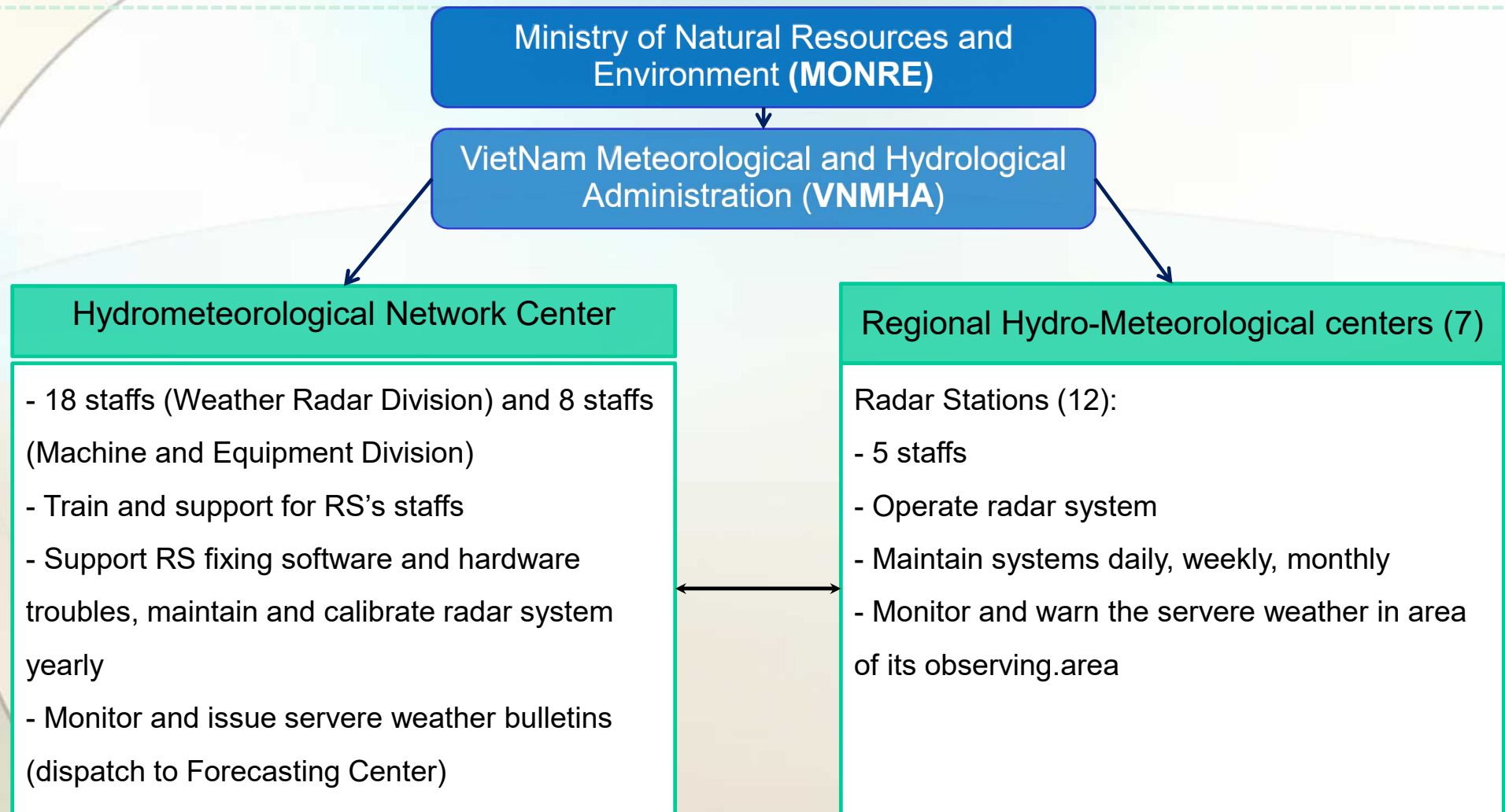
- 1. Organization and human resource**
- 2. Weather radar network in Vietnam**
- 3. Operation and Maintenance**
- 4. Challenges & Future Plans**

1. Organization and human resource

Organizational structure of VNMHA



1. Organization and human resource



2. Weather radar network in Vietnam

Vietnam weather radar history

Extension of the weather radar network
Phu Lien Upgraded to TRS-C-band radar.
Installed the second radar DWSR-93-C band at TamKy station

1998



Installed 2 new radar at Viettri and Vinh station (TRS-C-band radar)

2000



Install the seventh radar at Dong Ha station (C-and, DWSR-2501C), Upgrade at Tam Ky station (C-band, WDSR-2501C)

2009



Improvement and optimization of the network
Installed 01 new radar stations at Pha Din (C-Band, Dual-Pol, 2018)
Upgraded 02 radar station at Tam Ky (C-band) and Dong Ha (C Band)

2018



1989



1999



2004



2017



2019-2020

2023

Beginning of weather radar observation in Viet Nam
 The first weather radar installed on the top of Phu Lien (MRL-5,)

Installed the third radar at Nha Trang station
 DWSR-C band

The sixth radar was installed at Nha Be station
 DWSR-2500C

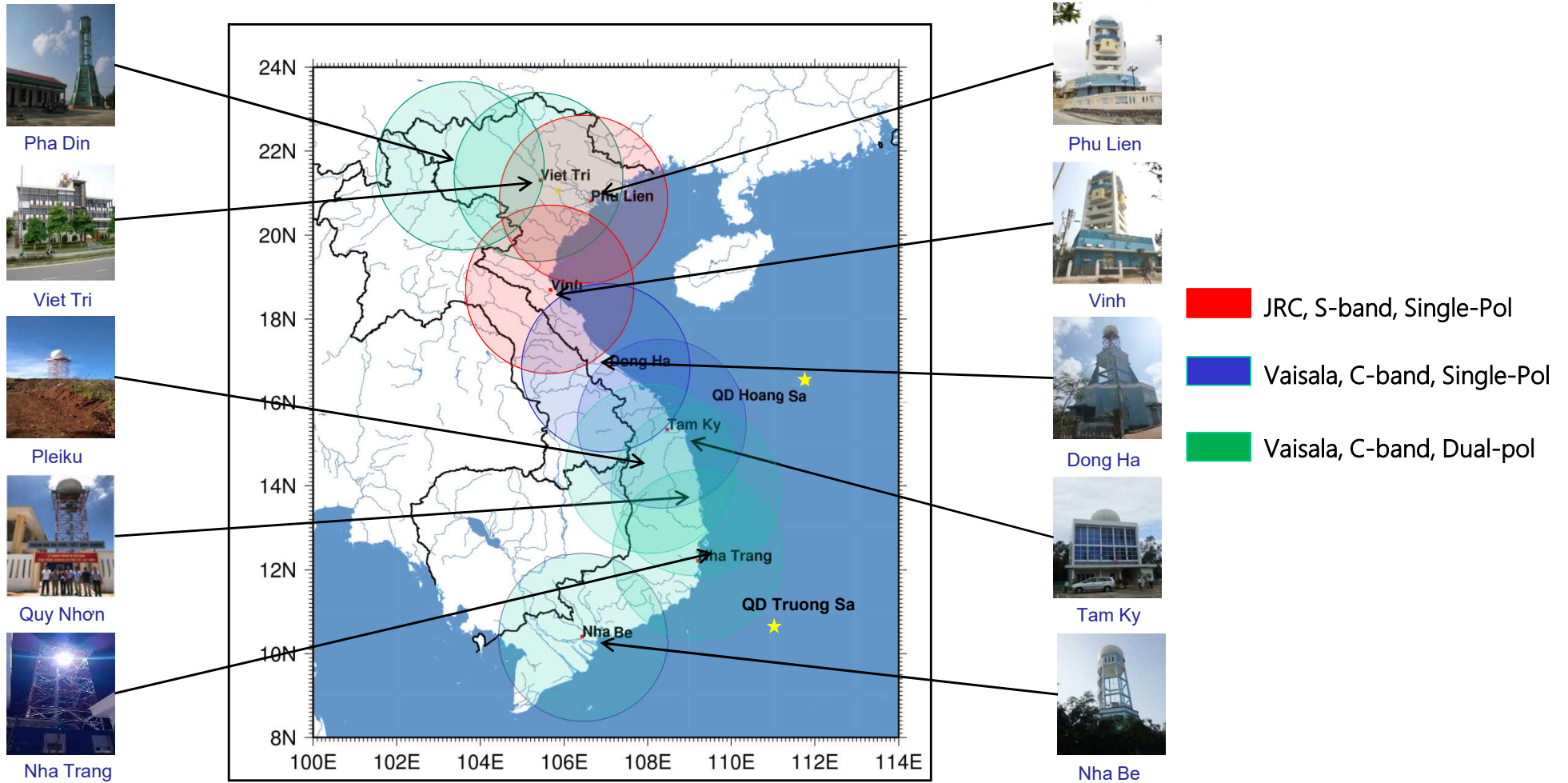
Improvement and optimization of the network
Installed 2 new radar stations at Phu Lien(S-band, 2017, JRC), and Vinh (S-band, 2017,JRC)
Upgraded Nha Be (C-band, Vaisala)

Install New Weather Radar system
 Pleiku (C band, Dual-Pol)
 Quy Nhon (C band, Dual-Pol)
 Nha Trang (C band, Dual-Pol)
 Viet Tri (C band, Dual-Pol)

Install New Mobil Weather Radar system
 Thanh Hoa (X band, WR-10X-Single-Pol)
 Hoa Binh (X band, WRS400, Dual-Pol)



2. Weather radar network in Vietnam



Weather radar network in Vietnam

2. Weather radar network in Vietnam

Radar	location		Height [m]	Beam Width [°]	Type	Band	Year of Installation (upgrade)
	Longitude [°E]	Latitude [°N]					
PhuLien	106.6333	20.8100	130.241	1.7	Single-Pol	S	2017
Vinh	105.7000	18.6500	99	1.7	Single-Pol	S	2017
VietTri	105.3036	21.4186	135	1.0	Dual-Pol	C	2018 -> 2020
Dong Ha	107.0833	16.8500	40	1.2	Single-Pol	C	2009 (2018)
TamKy	108.4667	15.5667	40	1.2	Single-Pol	C	1998->2010 (2018/02)
NhaTrang	109.3289	12.2378	472	1.0	Dual-Pol	C	2018 2020
NhaBe	106.7166	10.6586	25	1.0	Single-Pol	C	>2004 (2017/12)
Pha Din	103.5170	21.5713	1435	1.0	Dual-Pol	C	2018
Quy Nhon	109.1921	13.7482	538	1.0	Dual-Pol	C	2018 2020
Pleiku	107.9839	14.0343	835	1.0	Dual-Pol	C	2018 > 2020

+ Various manufacturer : Vaisala, JRC,...

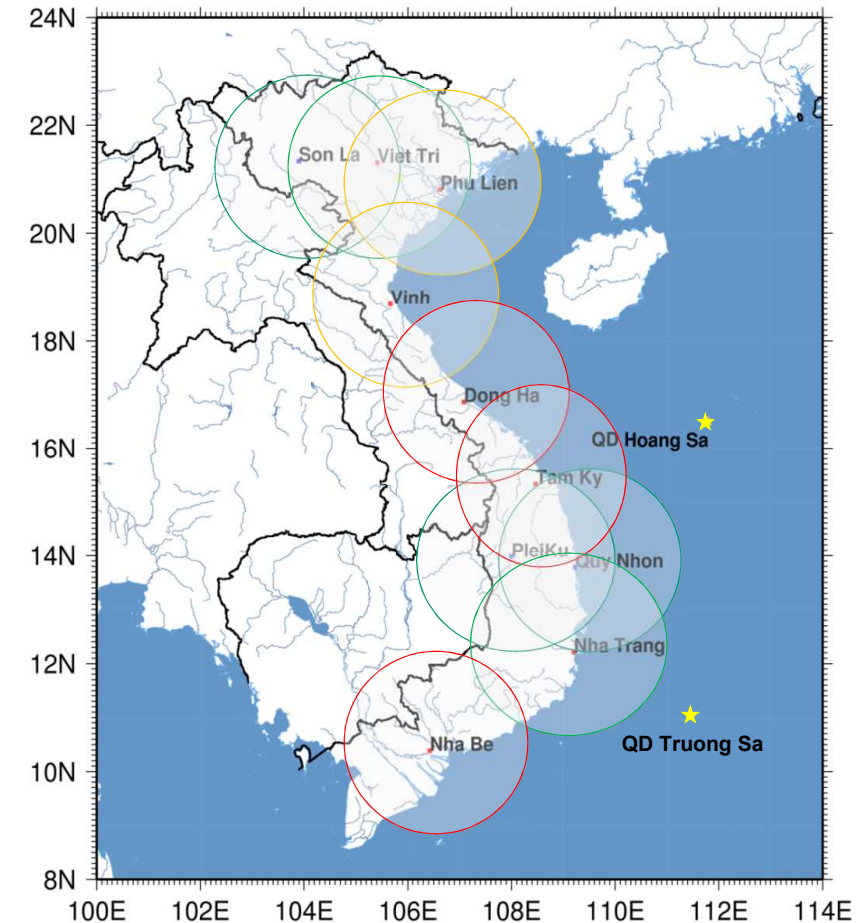
+ Many different bands: S band, Cband

+ Many different types: Dual-pol vs Single-pol

+ Many different transmitter (magnetron, solid state...)

→

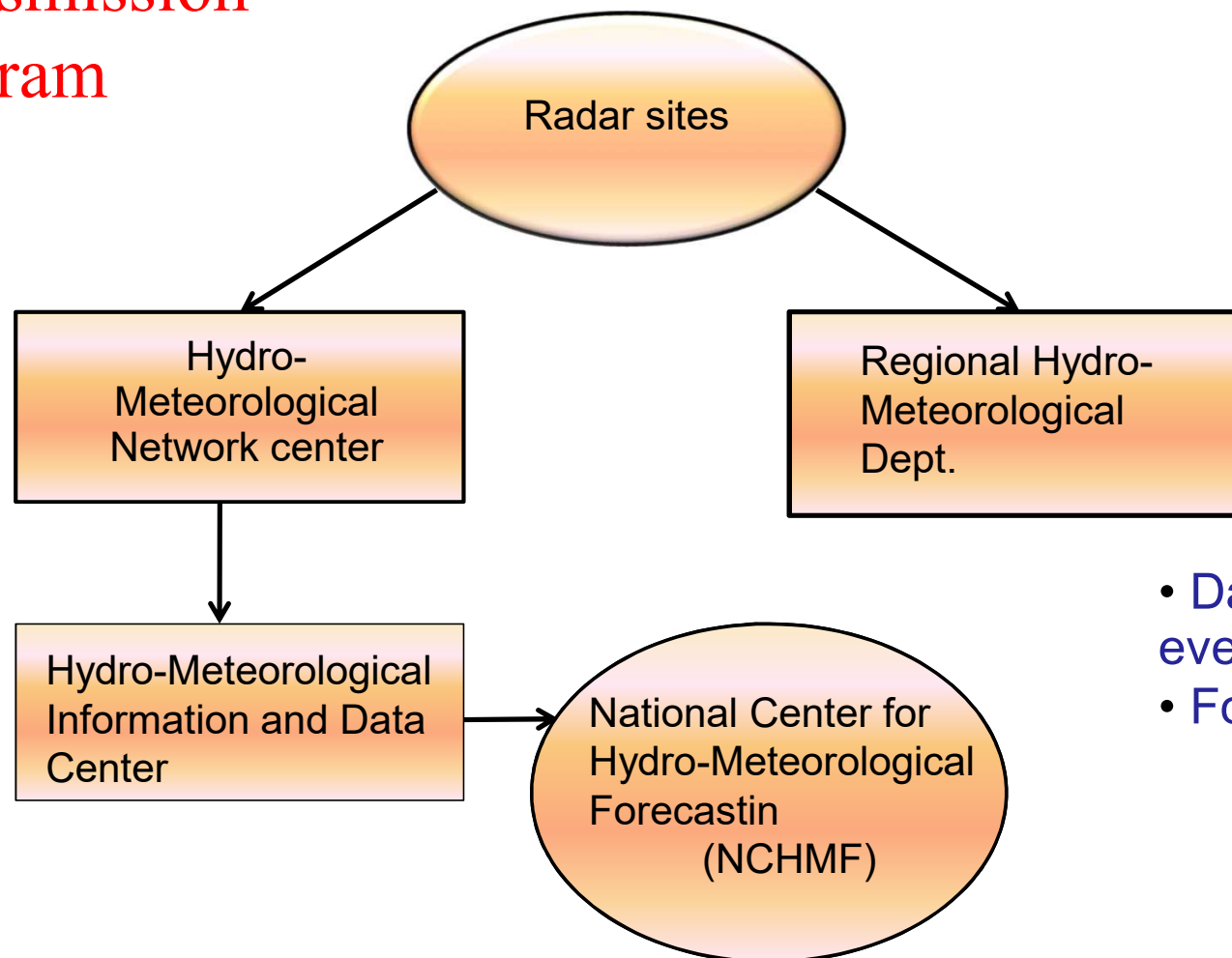
→



- Vaisala, C-band, Single-Pol
- JRC, S-band, Single-Pol
- Vaisala, C-band, Dual-pol

2. Weather radar network in Vietnam

Data transmission diagram



- Data is transferred for every 10 minutes
- Format file: binary

3. Operation and maintenance

Routine Maintenance



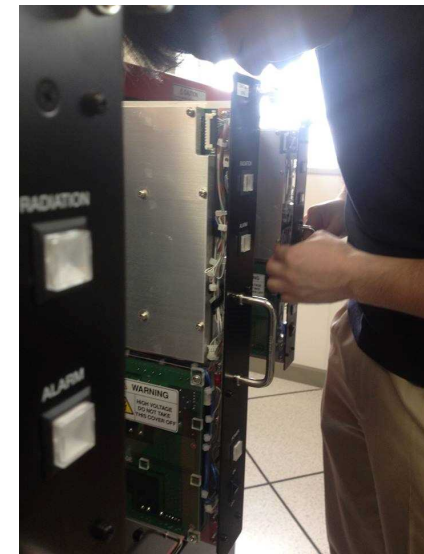
- Period of inspection, maintenance, periodical maintenance radar:
 - + Checking equipment: daily, weekly and monthly
 - + Routine maintenance: once a year (only mechanical control antenna system is performed every 6 months).
- Calibration routine weather radar: once a year but do not analysis calibration bias

3. Operation and maintenance

Routine Maintenance

Difficulties in maintenance:

- Technical profesional abilities.
- Lack of equipment and machinery for inspection and calibration. The current machines: out of date, and large errors.
- Machinery components and replacement equipments are not always available.





4. Challenges & Future plans

- Lack of experience in exploiting dual-polarization radar products, therefore need to study in using the data more effectively. In Vietnam, there is no equipment for particle size classification, so the use of dual polarized radar products has not been implemented.
- Continue applying QC to reduce/remove other clutters/noises
- Have not really mastered QPE technology yet
- There is a need for continued improvement in the accuracy of the QPF and the prediction of precipitation growth or decay.
- Additional weather radars should be added to locations with high mountain or areas heavily dominated by the local climate system.

THANK YOU !