

Steam Trap Maintenance Management

11th MMM Meeting

19 Mar 2014

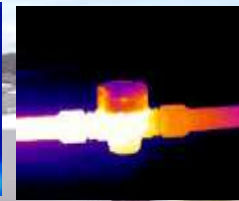
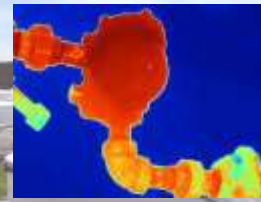


Mechanical Engineering Section

ยึดมั่นมาตรฐาน บริการด้วยใจ ก้าวไกลสู่สากล

- **Steam trap overview**
- **Maintenance work flow**
- **Manpower management**
- **Spare part management**
- **Survey record**
- **Failure root clause**
- **Initiative**

Steam trap overview



Maintenance type:	condition based
Routine monitoring frequency:	2 times/year

Number of steam trap(TOP group):	12,413 pcs.
TOP:	8,445 pcs.
TLB :	3,512 pcs.
TPX :	456 pcs.

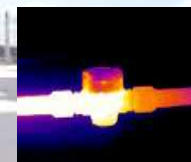
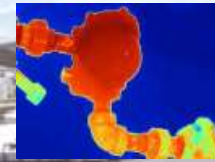
Maintenance spent Budget 2013 (TOP) :	3,085,710 baht
Survey round1	26,524,369 baht
Survey round2	30,300,843 baht
Steam loss saving 2013(TOP):	53,739,503 baht

Monitoring methods:

- visual inspect
- leak check by ultrasonic probe
- temperature check
- pressure check(some case)



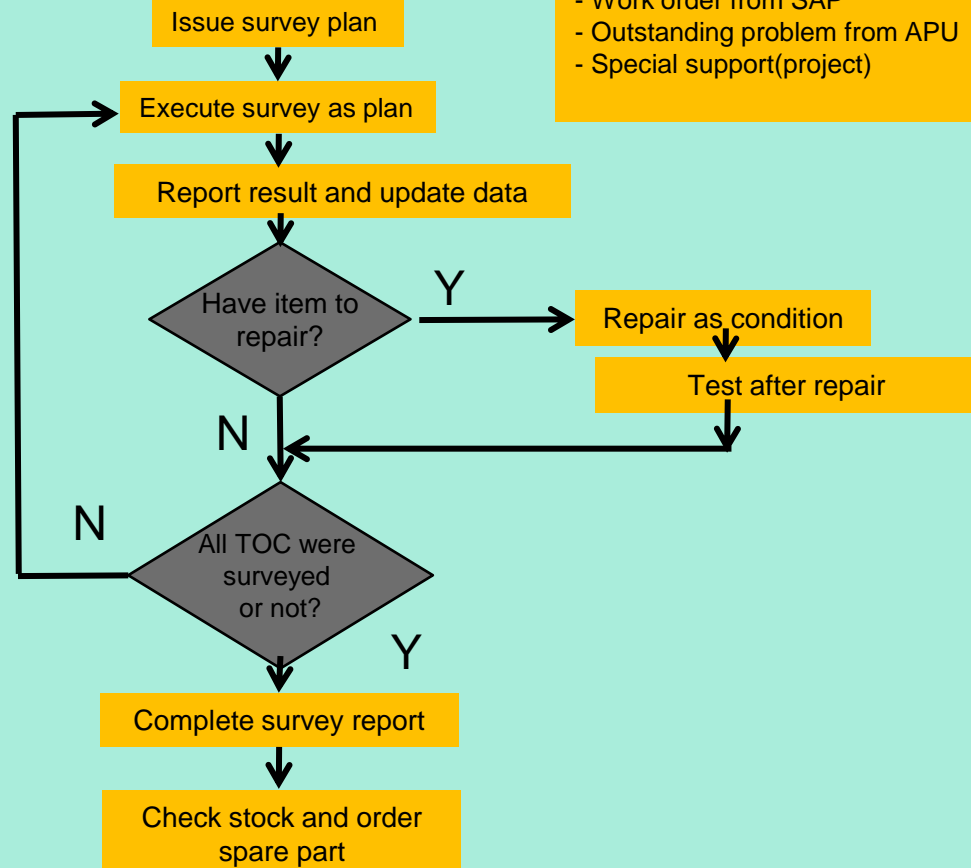
Maintenance Work flow



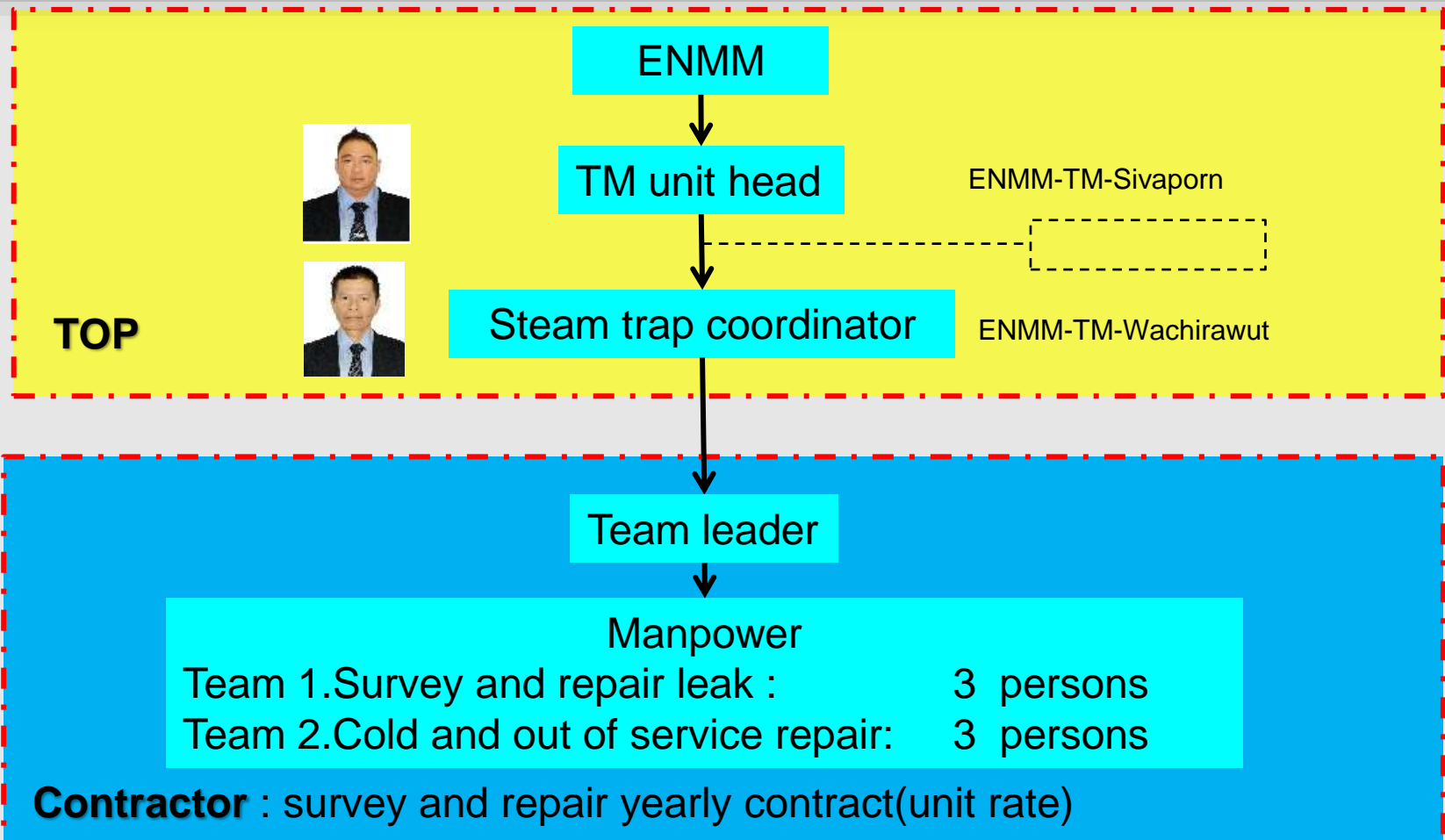
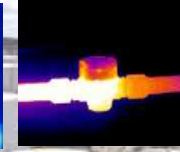
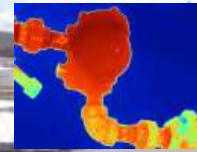
Routine work

Non routine work

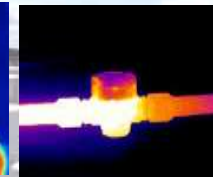
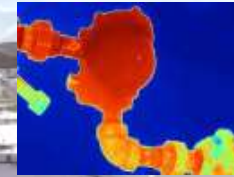
- Work order from SAP
- Outstanding problem from APU
- Special support(project)



Manpower management



Spare part management



Spare part
(Yearly order)



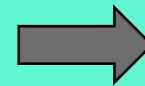
Mechanism spare part



If mean time failure is acceptable, we order spare part follow to original plant design.



Completed set

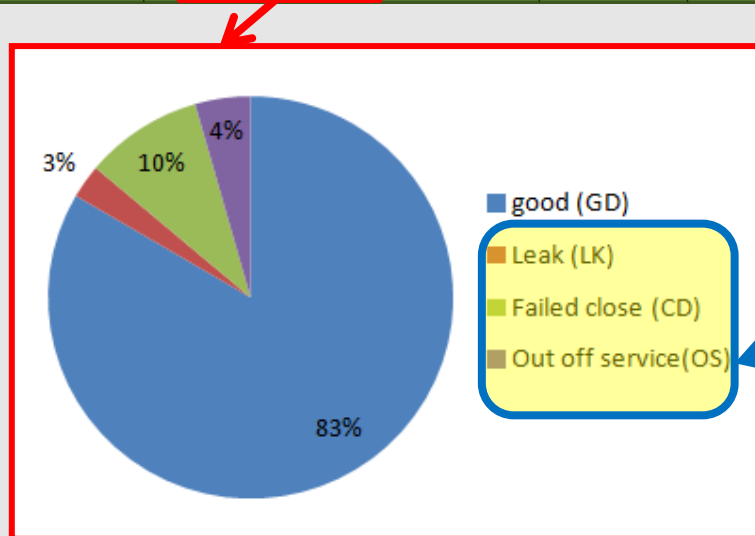


We review the compatible model from all vendors and open bid for price.

Survey record

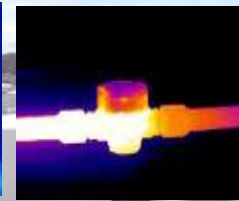
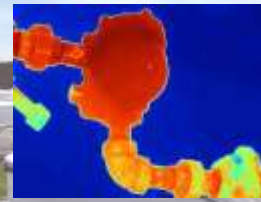
Thaioil survey result 2/2013

TOC	Total steam trap (Pc)	Steam trap good (GD)	Steam trap Leak (LK)	Steam trap Failed close (CD)	Steam trap Out off service(OS)
TOC-1	468	394	1	57	16
TOC-2	940	592	22	278	48
TOC-3	1,270	1,158	2	73	37
TOC-4	1,442	1,277	6	70	89
TOC-5	1,940	1,716	20	104	100
Utility	710	530	90	68	22
Off site movement	1,675	1,376	88	148	63
Total trap	8,445	7,043	229	798	375



Failure Mode

Failure root clause



Failure type: Leak

- completed mean time service life
- mechanism damage (for example: from hammering)
- scale in pipeline
- chemical contamination in pipeline
- choose improper type



Failure type: Out of service

- forget open after plant start up
- use only start up or S/D period
- steam trap was closed after operator found leak
- steam line was demolished by project

Failure type: Cold and failed close

- line plugged
- back pressure in condensate line
- choose improper type or capacity
- steam trap was installed in wrong direction





Q & A