ALARA OPTIMIZATION

Compressed air filtration for Breathing

Hanil Nuclear co. Shin-kori Office`

Contents

1 Technical Background

Optimization of ALARA !!!

BACKGROUND OF ITEM SELECTION

- Worker to work inside steam generator to supply Compressed Clean Air Breathing
- Compressed air contain moisture and small particles by pipe corrosion
- Hot and humid environment increase human temp. and cause of the fatigue
- Mist causes breathing and is not for visibility

PROBLEM WITH THE COMPRESSED AIR SUPPLY

- Use steel pipe for long-time, erosion phenomenon occurrence by air impact
- Small particles suspended in air by erosion
- Maybe not suitable for human breath.

Corroded
Pipe inside

PROBLEM WITH THE COMPRESSED AIR SUPPLY (CONT'D)

Solid

- Solids in air haled
- Impurities caused by the compression process
- Internal corrosives. ETC..

Liquid

- Condensate
- Oil drops
- Aerosol. ETC..

Gas

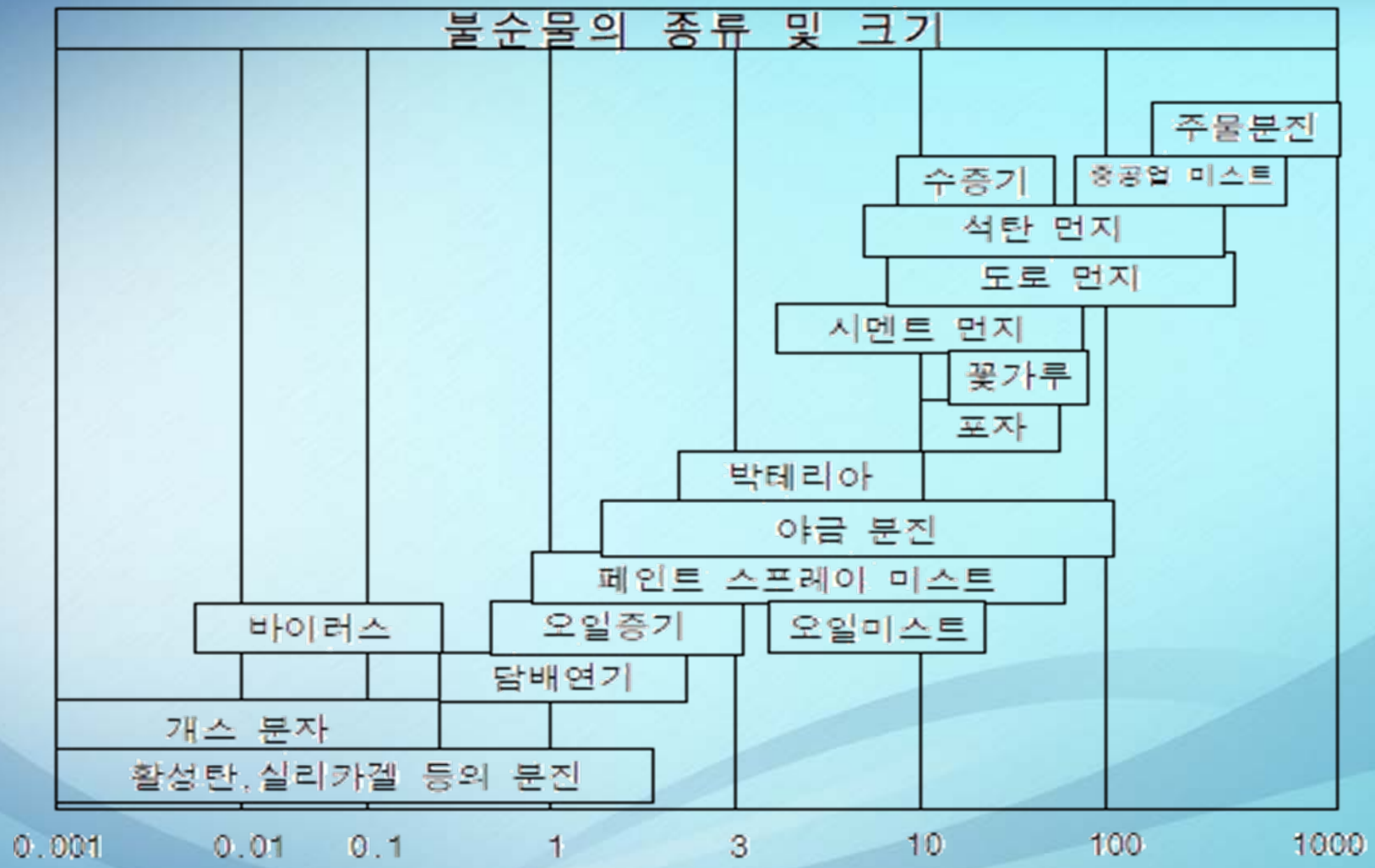
- Oil mist
- Unsaturated Hydrocarbons
- Corrosive ases,
- ETC..

PROBLEM WITH THE COMPRESSED AIR SUPPLY (CONT'D)

- Atomspheric Contains more than hundreds of millions dust and impurities
- The concentration of impurities from the air compression process is maxmized
- Speculation that about 140 million impurities exist in air of 1ton
- If undergo about 8bar pressure, number of impurities increases about 1120million per air 1ton

KIND AND SIZE OF IMPURITIES PIPE INTERNAL

Unit :μm



2 Contents of Development

CONTENTS

2 Air Filter Installation

- Clean Air Supply By Removal Dust and Oil mist
- Purification Filter for the Removal of Virus and Vacteria in the Air

Compressed Air Cooling System Installation

- Cold and Hot air Separation by Vortex and Supply Fresh Air to Worker
- Maintain Fresh condition internal workware and prevent mist by Supplying Cold air

Regulator Installation

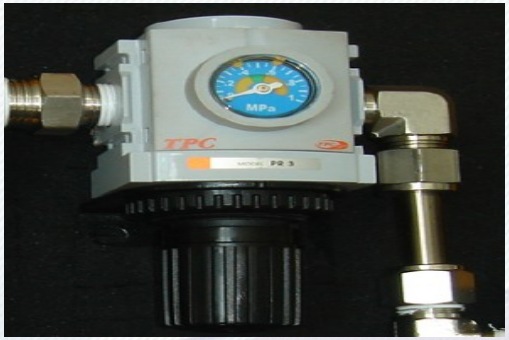
- Regulator for Suitable Air Supply in Worker's Breath
- When Air Supply Connector need, Extension Possibility

CONTENTS (CONT'D)

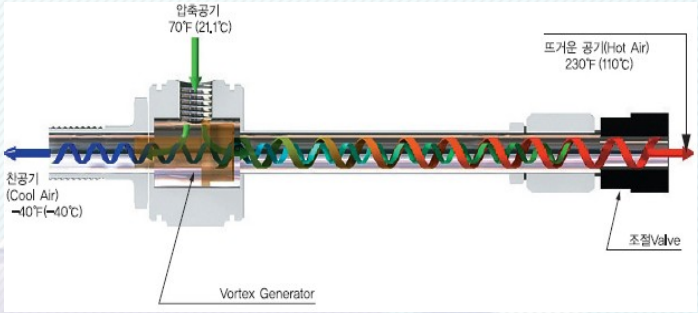
1st FILTER (NH-3200)

2nd FILTER (NH-13

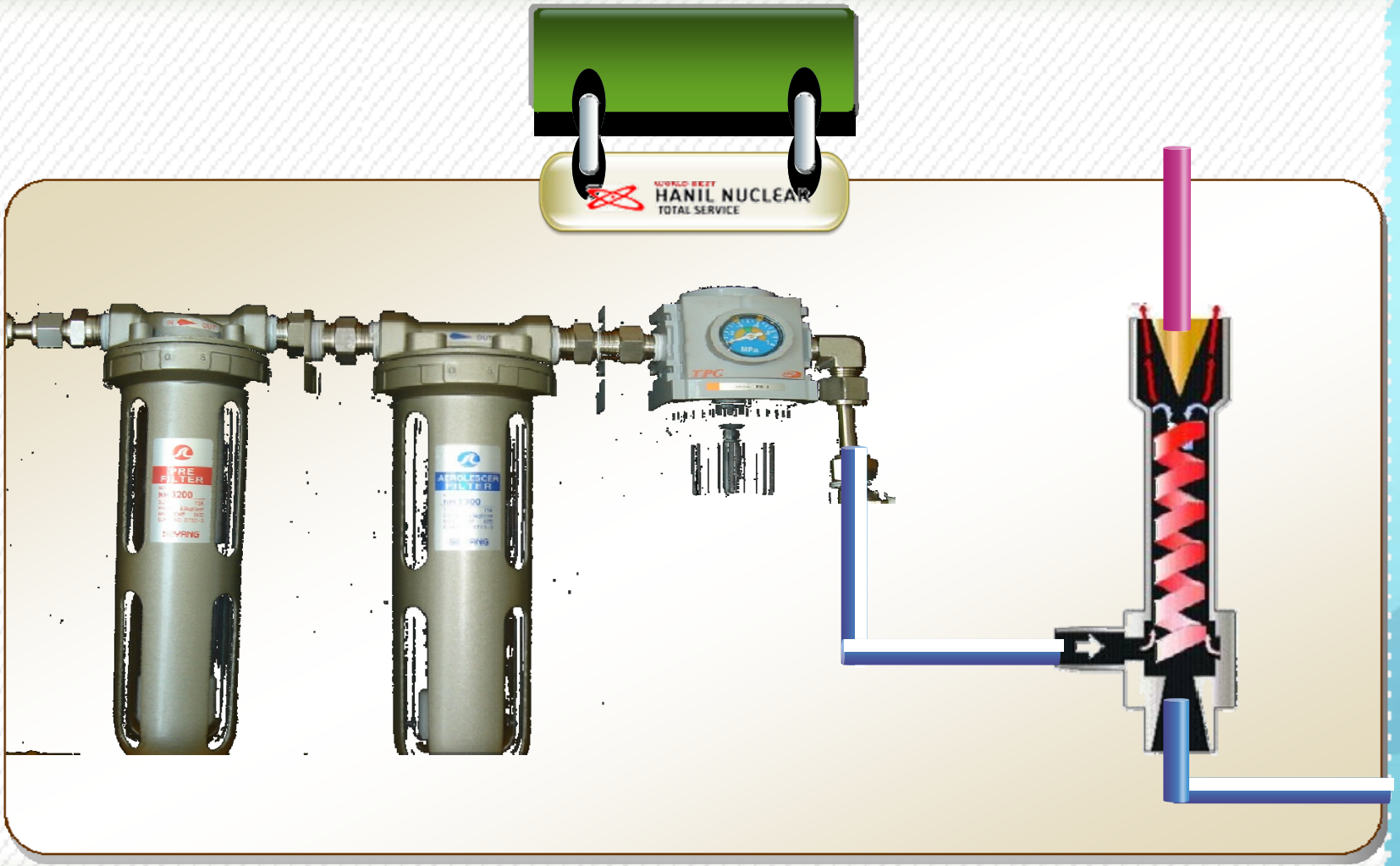
Regulator



Air Cooling System



EQUIPMENT COMPOSITION



3 Performance & Operation

FINISHED PRODUCTION EQUIPMENT

PERFORMANCE EVALUATION OF A PROTOTYPE

Filtration Capacity (1st Filter)

- Filtration : Particles 5 μm
- Element Structure : sintered Resin
- Performance : Removal condensate and Oil in the Air

Filtration Capacity (2nd Filter)

- Filtration : Particles 0.01 μm
- Element Structure : Urethane, Glass Fiber , Micro Fiber
  Punching Metal
- Performance : Oil 99.99% Removal , Oli mist >0.1 ppm

PERFORMANCE EVALUATION OF A PROTOTYPE (CONT'D)

Supply Air 23℃ Inlet Pressure (PSGI/BAR)	Division	Temperature (Unit : ℃)					
40(2.8)	COLD	-8.8	-6.9	-4.3	0.1	5.7	11.6
	HOT	27.8	24.8	34.2	45.9	56.8	70.2
60(4.1)	COLD	-17.2	-15.8	-11.3	-6	-0.1	6.9
	HOT	26.6	27.4	38.1	52	63.1	79.2
80(5.5)	COLD	-24.3	-21.6	-16.1	-10.5	-4.4	4
	HOT	26.3	29.7	40.8	56.5	68.6	85.4

Jade Color Section Displays Proper Temperature

STANDARD REQUIREMENTS

Application	Quality of Compressed Air	Impurities in Compressed Air			
		Moist-ure	Parti-Cles	Oil mist	smell
○ Food,Stirring, Transportation ,Drying, Packing, Brewing, ETC.. ○ Breathing ○ Clean Room	No Moisture, Dust, Oil and Smell ETC..	> -17℃	0.01μm	0.004㎎/㎥	No

BY : NIKKEI Published "Mechanical Separate Volume "`

4 Expect Effects

EXPECT EFFECTS

■ Reducing Working Time & Working Environment Improvement

- Improvement of the Working Condition by Filtration & supply Fresh air
- To Prevent Mist Contributes Reduction Working Time & Quality
- Comfortable Working Environment by Fresh Air Supply

■ Can be Used In Low Level Air Room and Close Chamber ETC..

- Application possibility to that oxygen closeness space work and so on

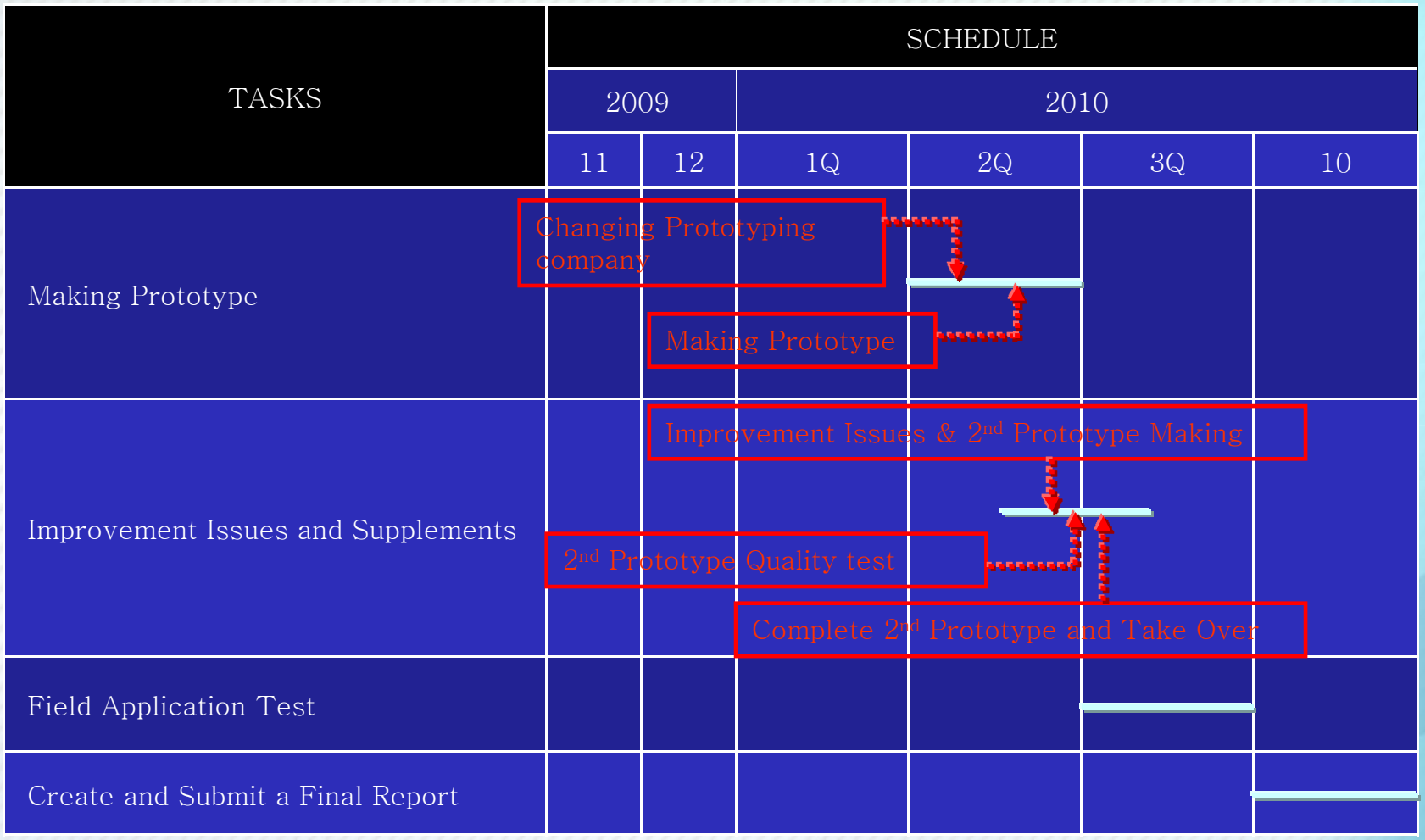
5 Future (Near) Plans

Action for ALARA !!!

FIELD APPLICATION PLAN

- Work on the Steam Generator During Overall
- Work on In-Core Thimble Cleaning
- Work on the High Radiation Area and Air Supply Work occurrence (Reactor, Valve, ETC..)

TASKS & SCHEDULE




THANK YOU