Performance Diagnostic System for Rotating Machines

1. Background and Direction for System Development

- Quick Detection of Process Equipment Problems and Prediction about Maintenance Period
- Total Management of Equipment from DCS and Alarm Information
- Safety Operation of Plant and Minimization of Manpower.

2. System Structure

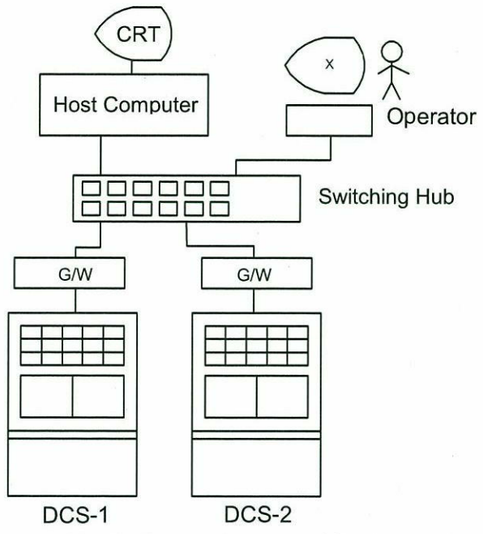


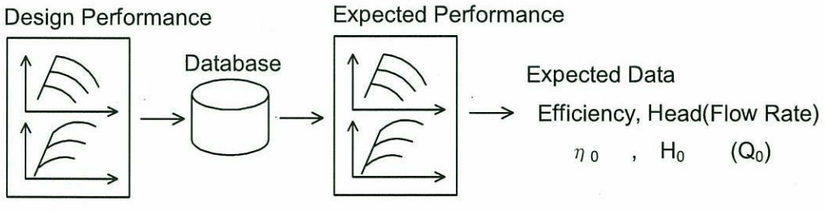
Fig. 1 Schematic Dwg. of System

- Host Computer (Existing)
  Alpha Station 500 5/333
  (production of DEC)
  O/S : Open VMS v.6.2
  SETCIM v.4.6
  GCS v.3.0c
  CM50S

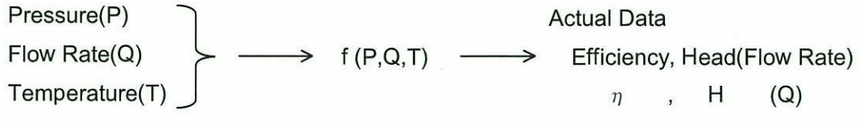
- X Terminal
  Celebris GL-6200
  (production of DEC)
  O/S : Windows NT v.4.0
  Reflection v.6.0

3. Basic Technology

(1) Performance Estimation



(2) Actual Performance



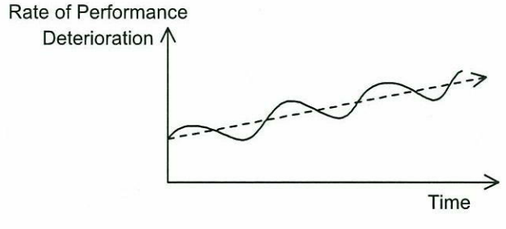
(3) Parameter of Performance Deterioration

$$\circ\Delta\eta = \frac{\eta - \eta_0}{\eta_0} \times 100 \quad (\%)$$

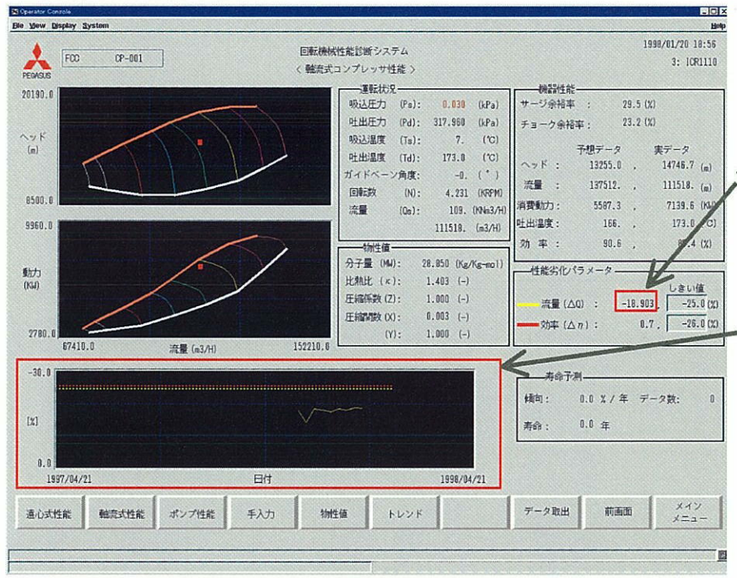
$$\circ\Delta H = \frac{H - H_0}{H_0} \times 100 \quad (\%)$$

$$\circ\Delta Q = \frac{Q - Q_0}{Q_0} \times 100 \quad (\%)$$

(4) Trend of Performance Deterioration



4. Example for System Operation



This window shows operating condition, present performance and performance deterioration status of target equipment.
The parameter of performance deterioration, "-18.903", shows that the performance calculated by flow rate is reduced by about 19% from design stage (initial stage).
The trend graph at the lower left shows that the performance is reduced as time passed.

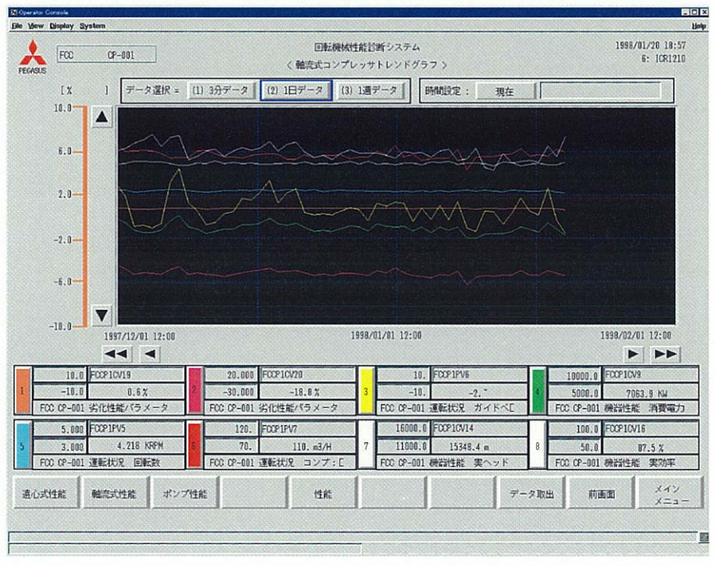


Fig. 3 Trend Graph

This window shows the trend graph of target equipment.
The graph shows the data of compressor for 1.5 months.