

Successful Implementation – Energy Conservation Measure

Measure
Reduce the operation of the compressor of Packaged Precision Air conditioner by utilization of the PAC Damper operation/Free Cooling option. (Utilization of the Cold Ambient Air for electronics equipment temperature maintaining purpose).
Equipment
Precision Air Conditioner (1.5 TR & 2 TR)
Industry / Sector
Reliance Infocomm Limited- Gujarat (Telecommunication)
Year of Implementation
2006
Cost Benefit Analysis
<input type="checkbox"/> Type of Measure: No Investment
<input type="checkbox"/> Annual energy Savings: 1.94 lakh KWH (For 175 sites)
<input type="checkbox"/> Actual cost savings: Rs. 12.66 Lacs (For 175 Sites) (Gujarat Circle is having total 480 operational BTS sites, where this measure is implemented).
<input type="checkbox"/> Actual investment: Nil
<input type="checkbox"/> Payback: Immediate
Implementation Highlights
<ul style="list-style-type: none"> ▪ Implementation of the Measure has resulted in: <ul style="list-style-type: none"> - No Cost Implementation - This measure can be duplicated for the Air conditioning systems, where the ambient temperature of the facility is lesser than the requirement. - Initially it is implemented at some of the sites. After getting satisfied results it is implemented at 175 Nos Base Trans receive station (BTS) of Gujarat Circle. - Life of the compressor will enhance with reduced operation hours. - Since DC Blower fan of PAC is running continuously, air circulation is maintained inside the shelter & no heating layer is established around Modcell (Main heat source-Major Load).

Summary

- Use of the Free cooling option of the Precision Air conditioner (opening of the Damper when ambient temperature is lower than the Shelter set temperature by 2-3 Deg. Cent) resulted in annual energy cost saving of Rs. 24.43 lacs (480 sites @Rs. 5089/PAC) by reducing the operation of the compressor used in packaged Precision Air conditioner.

Background

- Reliance Infocomm is the Leading Telecom Operator in India. For each Indoor Base Trans-ceive station it is required to have one precision Air Conditioner (1.5 TR/2 TR) to maintain the shelter temperature as per the requirement of electronics equipment's. (For Top Discharge PAC: Set point-25 Deg. Cent & For Bottom Discharge PAC: Set Point -26 Deg. Cent).
- Precision Air conditioner (PAC) is the measure variable load in Telecom utility equipment.
- During night hours & early morning hours (normally 00:00 Hrs to 06:00 Hrs) throughout the year & in winter even in day hours, ambient temperature many times remain below the shelter set temperature (i.e :below 24 deg. Cent).
- Each Packaged Precision air conditioner is having damper for Free cooling & Emergency Free cooling purpose. Till this initiative the Free cooling option was not utilized.
- With minor change in the set parameters/wiring of individual PAC, this scheme was possible.
- After various experiments SOP is established & it is first implemented at some of the sites & based on the fruitful result of the trial run, it is implemented at 175 sites of Gujarat Circle.

Implementation of the measure resulted in reduction of the PAC compressor average operation by 2 Hrs/Day.

Principle

- This measure makes use of the Ambient cold air for shelter maintaining the shelter temperature to its set temperature. This becomes possible with the use of damper available in precision air conditioner.
- During Night hours & early morning hours the ambient temperature is many times lower than the Shelter set temperature. As per the scheme, the PAC damper opens when the ambient temperature is lower by 2 deg than the shelter set temperature & again damper closes automatically when the ambient temperature increased 2 deg by shelter set temperature. All the sites are unmanned.
- Compressor off timing is based on the ambient temperature.

Details of techno-economics:

Particulars	Actual energy savings
Annual Total energy savings, KWH	1.94 Lakhs
Annual Cost Savings ,Rs.	12.66 lacs
Cost of Implementation, Rs.	Nil
Payback period	Immediate

Implementation issues

- Before implementation of the measure, it was suspected that the Air filter choking will increase drastically.
- After implementation of the measure in different areas like: residential/industrial areas the Air filter cleaning frequency was revised.

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