

Efficiency Promotion of Motor Systems in China

Wang Guoxing

Shanghai Energy Conservation Service Center

Efficiency promotion of motor systems in China

- Status for energy— saving of motor systems in China.
- Review of the history for saving energy of motor systems in China.
- The potential and development tend for motor systems energy saving in China.

Status for saving energy of motor systems in China.

Motor system is a kind of popular application system which converts electric energy into mechanical energy. The system includes three major parts: a drive control device, a electric motor and a driven equipment.

Electric motors are the largest consumers of electricity around the world.

- Governments of countries have all paid great attention to energy –saving of motor system, or motor system efficiency promotion. Chinese government has also regarded energy saving of motor system as one of the central points of the Energy Conservation Plan during the(2005-2010)period.

Content of the plan

- On the plan above, popularizing motor with higher efficiency, permanent magnet brush-free motors. Implement optimize reform project of motor system (fans, pumps ,air compressors) in the field of coal、 power、 colour-metal and petrochemical. Popularizing technologies of variable frequency drive and systems automatic greatly. Promotion 2 percent of efficiency for motor system in average nationwide.

2 Review of the history for energy — saving of motor systems in China.

- In China, a lot of work has been done in the field of motor system in the past three decades.

Higher efficiency motor replaced lower one

- Since 1983, according to the government's order, the JO, JO2 series motor models were replaced by Y series models, which are more efficient.
- Today, design and appraisal of the motor modal Y2 series with even higher efficiency have been completed and many plants make the products now.

Higher efficient driven equipment replaced which lower one

- Since 1983, higher efficient equipment like pumps, fans, air compressors have taken the place of lower efficient ones, such as pumps model BA series, fans model 70B2 series, air compressors model 1-10/8 series and so on.

Development control of the motor speed in china

- In China, the control of motor speed began in 1980s. To achieve more economy running with changeable work condition for fans and pumps, many means of speed control appeared, such as cascade speeds control, electromagnetic slip couple, hydraulic couple and so on. Since 90s, advanced variable frequency drives in motors have replaced the means above.

Content of China Motor System Energy-Efficiency Program

- development of training teaching materials and application tools for energy saving assessment,
- the modification of existing operation standards for pumps、 fans and air compressors,
- the training of systematic optimization experts, the organization
- the implement of the demonstration reform project.

Training experts, managers 、 engineers.

- Shanghai Energy Conservation Service Center, has hold training classes for systematic optimization experts.
- 12 issues of training classes have been hold and about 250 Shanghai managers and engineers have been trained in the aspects of management and technique as well.

Develop technology finish case and project

- We have developed synthesize energy-saving technology
- We have finished 38 case of assessment, 8 energy-saving project for demonstration

Three ways to increase efficiency of motor system

- Promote efficiency of motor and driven equipment for each unit.
- Promote operation efficiency of motor system .
- Promote energy utilization efficiency in motor system

3 The potential and development tend for energy -saving of motor systems in China.

- Though we have already done a lot of work, compared with the developed countries. We still have huge energy saving potential.

Motors and driven equipment are low efficient for each unit.

- . The average motor efficiency in China is about 3–5% lower than the average level of the foreign countries.

The operation efficiency existing of the motor system is about 20 percent lower than that of the foreign countries.

- Low efficiency equipment, the designed power output capacity often does not match the load
- According to the statistical data, the energy saving potential of motor system in China amounts to about 100 billions kWh.

Energy efficiency standard index lags behind

- The economic running standard index of fans, pumps and compressed air system is old. For example, The efficiency of pumps system is 37-51 %, and the efficiency of fans system is 50-60 %.

Chinese government has put forward concept of scientific development in recent years,

- In the Energy Conservation Plan during 2006-2010 period, it is put forward that the unit GDP energy consumption should be reduced by 20% during the five years, or 4% reduction in average for every year. These all have been set as the appraisal factors for local governments' performance.

China is now on the second stage of the China Motor Systems Energy-Efficiency

- Program that is to implement the program in nationwide scale. Not only the reform will be implemented in the existing project, the design of project, modification of Energy-Efficiency and economy running standard will also be focused.

New products of energy saving are emerging continuously

- Variable frequency speed control device, with diversified functions, are more and more matured , can be . They can be qualified for simple auto control system with a few PLC and PID control function themselves. Besides, the lower and lower price of frequency converter will be sure to take an important role to improve motor systematic efficiency.

I believe that in China, the
tomorrow of the energy- saving.

work must be more
beautiful !

That's all, thank you.
for your listening

Shanghai Energy Conservation
Service Center