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**Project Title:** Revision of Energy Labelling Standard in Centrifugal Pumps

|                                 |  |                              |                          |
|---------------------------------|--|------------------------------|--------------------------|
| <b>Department:</b>              | Comprehensive plan for needs assessment, prioritization, development, revision and supplementation of energy standards | <b>Employer:</b>             | Niroo Research Institute |
| <b>Project/Program Manager:</b> | Omid Shahhoseini   | <b>Executor:</b>             | Amir Sohrabi Kashani     |
| <b>Project Financial Code:</b>  | 700012   | <b>Project Quality Code:</b> | PDPN11                   |
| <b>Type of Project/Program:</b> | In-house   | <b>Assistant:</b>            | Aba-Niroo                |

**Project Staff:** Seyyed Mohammad Hamid Emami Khansari

**Project Necessity:**

Pumping systems consume nearly 20% of the electricity consumption in the industry sector that their contribution is between 25% and 50% at industry sector. Studies show that 30% to 50% of the energy consumed by pump systems can be saved by changing the control systems or related equipment.

For example, about 16% of total electrical energy was consumed in agriculture sector according to the Energy Balance Sheet of Iran Ministry of Power at 2014 that improving only a few percent of pumps efficiency can cause a very high energy saving. Similarly, urban and rural water and wastewater companies are applied a lot of electro pumps to supply drinking water that substantial energy savings can be made in this sector.

One of the ways to reduce consumption is the energy label, which exists today in most countries of the world, and the information contained in it, informs consumers about the energy efficiency of each energy equipment and provides common information about all devices and specific information related to Each electrical appliance is provided to consumers. In fact, the energy label helps the consumer to make an informed choice and choose a product with higher efficiency by providing the necessary information. The energy label also encourages manufacturers to improve product quality while keeping prices low.

Energy label standards for electric pumps have been developed in different countries. Mexico, for example, has had a mandatory energy label standard for centrifugal pumps since 2004, or India introduced an optional energy label standard in 2009. In Iran, since 1997, energy labels for electric pumps have been considered and the first standard of energy consumption labels for centrifugal pumps is entitled "Centrifugal pumps, mixed flow and axial, energy consumption measurement method and energy label instructions" with number 2-7817 was compiled in 2005.

In view of the above explanations and the considerable time elapsed since the preparation and compilation of the first version of the standard energy label for centrifugal pumps, it is necessary to revise the said standard. It is worth mentioning that this review has been done taking into account the existing capabilities in different sectors and the technologies provided, and finally, the energy label standard will be revised and the extracted minimum efficiency rules will be approved by the competent authorities.

**Project Goals:**

- 1- Preparing the energy labels for centrifugal pumps and approving it.
- 2- Collecting the information related to centrifugal pumps in different part of countries.

- 3- Codification of test procedure and repairing the energy label format
- 4- Preparing and codification of minimum energy efficiency for centrifugal pumps

### **Abstract:**

In this project, in the first step, the centrifugal pump industry in the country was statistically examined. In the second step, the collected information was analyzed and the most appropriate standard was selected and instructions for the required energy consumption tests were prepared. In the third step, laboratories approved by the National Organization for Standardization were tested and their capabilities were evaluated to test centrifugal pumps. In the fourth step, performance tests were performed. In the fifth step, the tests were analyzed and the information obtained from them was processed, and the functional specifications required for the energy label were determined. In the end, the test instructions were compiled and finally approved by the Article 11 Working Group.

### **Steps and Methodologies:**

- 1- Gathering information
- 2- Analyzing the collected information and selecting the most appropriate standard and preparing instructions for energy consumption tests.
- 3- Identifying laboratories approved by the National Standard Organization for testing centrifugal pumps along with evaluating their capabilities
- 4- Performing functional tests
- 5- Analyzing the tests and processing the information obtained from the tests along with determining the functional specifications required for the energy label
- 6- Compilation of test instructions and final approval

### **Main Results (technical outputs, patents, papers, books, reports, etc.):**

- 1- National Standard of Iran No. 7817-2, the first revision of 1400