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Project Title: Roadmap of mechanical surface treatment technologies for different parts of power plane rotational equipment

Department:	Power generation	Employer:	Niroo Research Institute
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Project Financial Code:	929700	Project Quality Code:	PMEPN33
Type of Project/Program:	Interior	Assistant:	Research

Project Staff: -

Keywords: Mechanical surface treatment; Power plant mechanical parts; Roadmap; Development of technology; Thermal power plants; Vision statement.

Project Necessity:

Today, one of the challenges facing communities is providing energy with proper efficiency and reducing environmental pollutants. In this regard, the development of mechanical surface treatment technologies for the power plant components as one of the most important technologies for power plant equipment lift enhancement is essential. For proper planning based on the needs of the country in the development of mechanical surface treatment technologies for the power plant components, it is necessary to first identify the leading challenges in the development of these technologies and for each of these challenges, appropriate policies and measures to fix them to be compiled.

In Iran, due to the important role of gas and combined cycle power plants in electricity generation, the subject of the development of mechanical surface treatment technologies for the power plant components is considered as an important solution to meet the equipment lift enhancement and increasing the security of country's energy supply.

Project Goals:

After determining the development priorities and style of technology acquisition, it is necessary to formulate macro and micro policies, which in this project reviews the literature in this field. This step is done in order to determine the guidelines and remove the obstacles and challenges facing technology development. In the meantime, structural barriers and challenges have been of considerable importance, therefore, it is necessary to formulate a set of policies to address them and to identify policies to improve the current structure using tools such as institutional mapping and

analysis of the existing structure. As a result, the literature on this subject has also been reviewed. In the following, after reviewing the concepts and definitions of policies, their typology will be introduced and a method for designing these policies will be presented. Also, the literature and concepts related to the structure governing the technology system have been studied.

After recognizing the priorities of technology development and determining the relevant strategies, it is necessary to design a roadmap for their implementation. In other words, it is necessary to show the set of measures required to achieve the goals in a timely manner and to determine the tasks of each of the relevant institutions. In this project, first the concepts and methods of roadmap development are reviewed and then based on the basics of roadmap development, while identifying the necessary operational items to develop a roadmap for the development of mechanical surface treatment technologies for the power plant components, the process of compiling a map and its final drawing will be presented.

After determining the development priorities and style of technology acquisition, identifying challenges, formulating policies and policy and technical measures, and developing a roadmap, the mechanism for evaluating and updating the plan has been determined. There is usually no guarantee that the policies and programs adopted will lead to the successful development of technology. Therefore, sometimes after an action or policy has been implemented, stakeholders, policymakers, or analysts decide to evaluate the extent or how the goals are being achieved. In other words, they want to know how far the goals of the policy or program have been achieved. This is because unforeseen events, unexpected consequences can cause a gap between the results of a policy or program and what was expected of it. Therefore, in the final part of the project, these issues are reviewed and a document update program is developed.

Abstract:

In this project, at first, the issues of formulating policies and technical measures in the field of mechanical surface treatment technologies for the power plant components were dealt with. In this regard, in addition to a brief review of the literature, the issues related to the challenges facing the development of mechanical surface treatment technologies for the power plant components were identified, the most important of which are:

- Lack of structured support from the private sector in the development of technology
- Lack of proper mechanism for technology transfer, law-making in order to oblige foreign companies to train technicians in case the product enters the country
- The activities of research centers and universities are not in line with the needs of industry
- Inefficient mechanism of knowledge exchange related to power plant equipment and parts between oil industry, electricity industry and military industries
- Lack of a comprehensive database of the latest achievements and researches of the country in the field of mechanical surface treatment technologies for all researchers, manufacturers and policy makers
- Lack of a centralized policy body in the field of mechanical surface treatment technologies consisting of different actors

- Insufficient use of the country's propaganda and extension capacities in order to promote the use of mechanical surface treatment technologies by power plants

Then, while reviewing the concepts related to the roadmap, the necessary projects were identified, scheduling and costing of priority projects were identified for each category of identified technologies, and in the form of a roadmap, their implementation time process was determined. Accordingly, the titles of the first and second priority projects identified for each category of technologies were presented.

Finally, while expressing the concepts related to the subject of evaluating and monitoring the progress of the strategic plan, appropriate indicators were identified to evaluate, control and monitor the progress of the strategic plan. At the end of the annual evaluation program of the project, the key indicators of the project were identified. It was further stated that a committee consisting of representatives of the Ministry of Energy, Industry and the University will be formed to evaluate the progress of the project and update the plans. Also, the time period required to update the implementation schedule and review and, if necessary, review the content of the strategic plan, was considered one year.

Steps and Methodologies:

- Extraction of construction technology tree for mechanical surface treatment technologies
- Codification of policies and technical measures in the field of mechanical surface treatment technologies
- Identify the challenges facing the development of mechanical surface treatment technologies for the power plant components
- Identify the necessary projects, determine the schedule and estimate the costs of priority projects for each category of technologies
- Identify appropriate indicators for evaluating, controlling and monitoring the progress of the strategic plan for the development mechanical surface treatment technologies for the power plant components

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

- ✓ Identify the requirements of specialized knowledge in the field of research and development mechanical surface treatment technologies for the power plant components
- ✓ Identify the quantitative and qualitative requirements of the power plant industry
- ✓ Identifying market stakeholders and identifying domestic and foreign companies and private and governmental groups that produce or have potential or actual knowledge in their field of expertise and contacting them
- ✓ Statistical analysis of the quality of parts and equipment used in power plants
- ✓ The method of interagency interaction in the field of leading the implementation of projects in the form of technology development projects is introduced and the required budget and time with the custodian of each project
- ✓ Continuous monitoring and evaluation of the existing technical knowledge in the field of mechanical surface treatment technologies for the power plant components

- ✓ Develop a comprehensive program to direct research and development activities and prepare the necessary instructions and monitor its implementation