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**ENERGY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

NB/T 20580.4-2021

**Budget estimation norm of nuclear power plant construction
project works - Part 4: Ventilation and air-conditioning
installation engineering for nuclear island**

核电厂建设工程概算定额 第4部分：核岛通风空调安装工程

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Foreword

This document was issued on 7 January 2021 by the National Energy Administration of the PRC and takes effect on 1 July 2021.

It is a NB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 01.040.27, Chinese classification F 02.

This document was drafted in accordance with the rules given in GB/T 1.1-2020, Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents.

This document is Part 4 of NB/T 20580, Budget estimation norm of nuclear power plant construction project works. The following parts of NB/T 20580 have already been issued.

Part 1: Nuclear island civil construction works.

Part 2: Nuclear island mechanical equipment installation works.

Part 3: Nuclear island piping installation works.

Part 4: Nuclear island ventilation and air-conditioning installation works.

Part 5: Nuclear island electrical installation works.

Part 6: Nuclear island instrumentation and control and communication installation works.

Part 7: Conventional island building works.

Part 8: Conventional island thermal equipment installation works.

Part 9: Conventional island electrical equipment installation works.

This document was proposed by the Nuclear Power Standardization Technical Committee of the energy industry.

This document is under the jurisdiction of the Nuclear Industry Standardization Research Institute.

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1 Scope

NB/T 20580.4-2021 is Part 4 of the Chinese budget estimation norm for nuclear power plant construction, and it prices the installation of ventilation and air conditioning in the nuclear island. A budget estimation norm is the book of unit rates used at the design stage to build a cost estimate: for each defined item of work it states how much labour, machinery and material that work consumes. The scope here is the ductwork and the plant that moves and treats air in the nuclear island - ducting in stainless steel, carbon steel, fire-resistant material, glass reinforced plastic and aluminium across the range of gauges, the fittings, supports and hangers that go with it, the control and isolation dampers, and the air handling units, fans, coils and filter housings. Each quota item states the work content it includes, the unit of measurement, the labour hours by trade, the machine-shift consumption by equipment type and the material quantities with their base prices. The volume explanation at the front sets out the scope of the quotas, what each rate already covers, the adjustment coefficients for working conditions such as radiation area, height and confined space, and the rules for measuring quantities; the chapter notes add the conventions specific to each group. It applies to new pressurised water reactor units and extensions, and to the balance of plant sub-projects that carry nuclear safety requirements.

This norm specifies the norm for nuclear island ventilation and air-conditioning installation works within the budget estimation norm for nuclear power plant construction works.

This norm applies to the nuclear island works of newly built and extended pressurised water reactor nuclear power units, and to the sub-items with nuclear safety requirements within the BOP works, such as the nuclear island liquid waste storage tank building, the conventional island liquid waste storage tank building, the radioactive solid waste treatment auxiliary building, the solid waste interim storage building, and the radioactive machinery repair and decontamination workshop. Other reactor types and other nuclear works may use it for reference.

Structure of this part: Volume Explanation; Chapter 1, Making and installation of ventilation

ducts; Chapter 2, Making and installation of regulating valves; Chapter 3, Installation of ventilation and air-conditioning equipment.

2 Volume Explanation - General Provisions

1. This norm is implemented together with the Fee norm for nuclear island construction and installation works of nuclear power plant construction projects and with the Machine-team fee norm for nuclear power plant construction projects.

2. The norm is the basis for preparing the budget estimation of the preliminary design; it is the reference basis for preparing the bid control price and the tender quotation of works at the preliminary design stage; it is the basis for formulating the investment control plan, for carrying out technical and economic analysis and comparison, and for controlling the construction drawing budget; it is also the foundation for compiling budget estimation indexes.

3. The norm is compiled under normal natural conditions and environment, on the basis of the rational construction organization design and construction machinery allocation of the present stage, taking rational parallel operation into account, and on the basis of the relevant technical standards, the construction and acceptance codes, the quality outline and the safe operating procedures of pressurized water reactor nuclear power plants, and of the requirements for civilized construction and environmental protection on the construction site.

4. The consumption of labour, materials and construction machinery in the norm reflects the construction technology level and the organization level of nuclear power plant construction at the present stage. Except where adjustment is expressly permitted in the norm, the norm shall not be adjusted on account of differences in construction organization, operating method or material loss.

5. The labour cost of the norm is stipulated as follows. a) The labour days of this norm are expressed as composite labour days, without distinction of trade or of technical grade; each composite labour day is considered on the basis of an eight-hour working system.

5. b) The composite unit price of this norm is implemented at a labour cost of 135 yuan per labour day for production workers, which includes basic wage, wage-type allowance, auxiliary wage, employee welfare cost and labour protection cost.

6. This norm is compiled on the basis of the following normal construction conditions. a) Equipment, materials, finished products, semi-finished products and components are complete and undamaged, conform to the quality standards and to the design requirements, are accompanied by certificates of conformity and test records, and their supply meets the installation schedule requirements.

6. b) Parallel operation between the installation works and the civil works is normal, and the

civil works do not affect the normal construction of the installation works.

6. c) The installation location, the buildings and structures, the equipment foundations and the reserved holes conform to the design standards and meet the installation requirements.

6. d) The site installation conditions conform to the design requirements and satisfy the technical conditions.

6. e) Water supply and power supply meet the normal use of the installation construction.

6. f) The geographical environment and the climatic conditions do not affect the normal operation or the physical health of the installation workers. Construction in special environments shall be charged separately in accordance with the relevant provisions.

7. The material cost is stipulated as follows. a) The materials in this norm include the main materials, the auxiliary materials and the sundry materials directly consumed in the installation work content; the material consumption includes the quantity used, the spreading quantity and the specified loss directly consumed in the installation work content.

7. b) The material loss includes the transport loss from the site warehouse, the site stacking place or the site processing place to the installation place, the construction operation loss and the site stacking loss.

7. c) The materials for which no unit price is indicated in this norm are main materials; their price is not included in the base price and shall be calculated at the actual price on the basis of the quantities listed.

7. d) The other sundry materials of this norm are combined as other material cost and are included in the material cost calculated in yuan.

7. e) The consumption rates of the main materials of the installation works are given in the norms of Part 2 to Part 6.

7. f) The unit price of the materials is taken from the material price list, and the material transport and miscellaneous charge is 2.5%.

8. The cost of use of construction machinery is stipulated as follows. a) The cost of use of construction machinery in this norm is expressed as the consumption of machine-teams.

8. b) The construction machinery of this norm is determined comprehensively on the basis of normal and rational machinery allocation and of the level of mechanical equipment of the construction enterprise; where the actual situation does not agree with the norm, no adjustment shall be made except where otherwise stated in the individual chapters.

8. c) Only the consumption of the main equipment, implements, instruments and meters is listed in the norm sub-items; those used in very small quantities and having very small influence on the base price are combined as other machinery cost and are included in the machinery cost calculated in yuan.