

A photograph of a nuclear power plant. In the foreground, two workers wearing yellow hard hats and high-visibility jackets (one yellow, one red) stand on a concrete path, looking towards a large, metallic, dome-shaped structure. The dome is part of a larger building with a grid-like pattern. In the background, another large, white, cylindrical structure is visible, also with a grid-like pattern. The sky is clear and blue. The overall scene is industrial and professional.

Proven Pneumatic Actuators for Air Operated Valves (AOVs) in Nuclear Service

Bettis™ N-Series Pneumatic Actuators

Proven for Nuclear Service



Your Nuclear Power Partner

■ **EQ-Qualified Actuators**

■ **More Than 35 Years Nuclear Experience**

■ **Pioneers in Scotch-Yoke Valve Actuation**

■ **Complete Product Range**

Bettis™ valve actuators have been the standard for many industrial and energy-related applications for more than 50 years. Bettis actuators were qualified through independent accreditation to meet the IEEE 382 standard when the standard was first drafted in 1969. Since then, they have been an industry standard by maintaining environmental qualification from the 1980 IEEE specifications, to the current 1996 criterion to meet the IEEE 382-2006 standard.

Emerson's quality assurance program for nuclear service conforms to the specifications of 10 CFR 21 and 10 CFR 50 Appendix B.

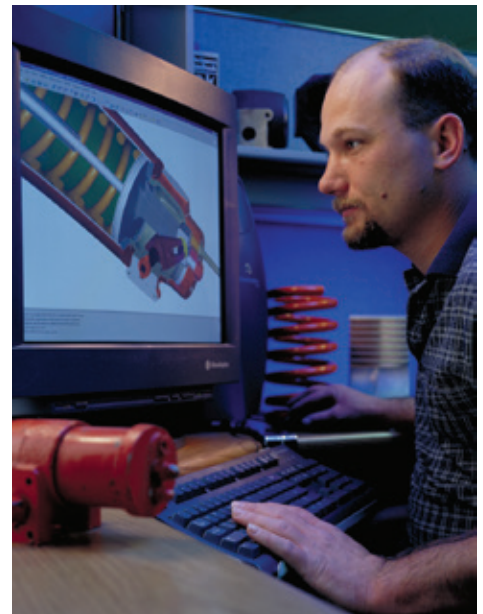
The Bettis N-Series Environmentally Qualified (EQ) actuators are uniquely constructed and have undergone rigorous testing and qualification programs to validate and document product performance for use within the containment and safety-related areas. This series has been subjected to environmental qualification testing and are aged to the service life required by the IEEE specifications through thermal aging, radiation aging, Loss of Coolant Accident (LOCA), Main Stream Line Break (MSLB), seismic simulations, and other functional tests.

Currently, Emerson has a global installed base of more than 5,500 actuators in more than 75 nuclear power plants, many of which are the environmentally qualified NT, NHD, NCB models. These models were tested and qualified in 1980 to the current IEEE standards and are still available today. The new generation NCBB, NCBA300, and NG Series are available in double-acting and spring-return qualified for nuclear power plant design criteria and the current IEEE standards:

- IEEE Std 382-2006
- IEEE Std 344-2004
- IEEE Std 323-2003
- ASME QME-1
- ASME NQA-1

Benefits:

- Modular design for parts interchangeability
- Five-year material and workmanship warranty
- IP66 and IP67M water ingress protection
- PED/97/23/EC compliance
- ATEX certification
- Compact footprint
- Guaranteed torque outputs
- Broad torque range



Proven Actuation for Nuclear Application

Emerson offers a broad range of actuators for environmentally qualified (EQ), seismic and general applications.

Emerson's Actuation Technologies' Crossridge facility, located in Houston, Texas, with its select sales channel, have been successfully audited by the Nuclear Procurement Issues Committee (NUPIC) and Nuclear Industry Assessment Committee (NIAC) as a supplier of products to the nuclear industry.

The Bettis N-Series is distributed and serviced by the most experienced technicians in the industry, trained to operate in containment areas and with a solid understanding of the regulatory requirements so that compliance is assured.

Bettis actuators are backed by Emerson and its extensive worldwide distribution network, to provide spare parts and service when you need it. Consider Emerson as your trusted nuclear partner.



NG-Series

Reliable spring-return or double acting compact actuators with an optimized center of gravity and lighter weight than others of equal or less torque output. With advanced corrosion resistance, water ingress protection, high wear resistance, the NG-Series provides a long service life that meets plant lifecycle. The NG-Series design facilitates ease of service while the actuator is valve-mounted. NG-Series actuators provide up to 900,000 lb-in of torque output in a double-acting configuration.

NCBB-Series

Available in spring-return or double acting configurations, with superior seals for water ingress and corrosion resistance. Available with dual-mounting valve interface for easy installation in any position - parallel or at right angles to the flow line, in a vertical or horizontal plane. NCBB-Series actuators provide up to 11,500 lb-in of torque output in a double-acting configuration.

NCBA300-Series

Available in spring-return or double acting configurations with advanced water ingress and corrosion protection, with superior seals. The model has no gaskets, and its all-bearing design helps enhance its total cycle life capabilities. NCBA300-Series actuators provide up to 20,000 lb-in of torque output in a double-acting configuration.



Your Actuation Solution Partner

Emerson has been an industry standard the nuclear power industry for decades with brands such as Fisher, Rosemount, Micro Motion, Dietrich Standard and PI Components.

- Control Valves
- Pressure Management
- Flow Measurement
- Temperature Measurement
- Process Automation Systems
- Analytical Instruments
- Maintenance and Configuration Software

This product is only intended for use in large-scale fixed installations excluded from the scope of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2).

World Area Configuration Centers (WACC) offer sales support, service, inventory and commissioning to our global customers. Choose the WACC or sales office nearest you:

NORTH & SOUTH AMERICA

19200 Northwest Freeway
Houston, TX 77065
USA
T +1 281 477 4100
F +1 281 477 2809

Av. Hollingsworth,
325, Iporanga Sorocaba
SP 18087-105
Brazil
T +55 15 3238 3788
F +55 15 3228 3300

ASIA PACIFIC

No. 9 Gul Road
#01-02 Singapore 629361
T +65 6501 4600
F +65 6268 0028

No.1 Lai Yuan Road
Wuqing Development Area
Tianjin 301700
P.R.China
T +86 22 8212 3300
F +86 22 8212 3308

MIDDLE EAST & AFRICA

P. O. Box 17033
Dubai
United Arab Emirates
T +971 4 811 8100
F +971 4 886 5465

P. O. Box 10305
Jubail 31961
Saudi Arabia
T +966 3 340 8650
F +966 3 340 8790

24 Angus Crescent
Longmeadow Business Estate
East P.O. Box 6908;
Greenstone; 1616
Modderfontein, Extension 5
South Africa
T +27 11 451 3700
F +27 11 451 3800

EUROPE

Berenyi u. 72-100
Videoton Industry Park
Building #230
Székesfehérvár 8000
Hungary
T +36 22 53 09 50
F +36 22 54 37 00

For complete list of sales and manufacturing sites, please visit www.emerson.com/actuationtechnologieslocations
Or contact us at info.actuationtechnologies@emerson.com

www.emerson.com/bettis

©2018 Emerson. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Bettis is a mark of the Emerson family of companies. All other marks are property of their respective owners.

The contents of this publication are presented for information purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.