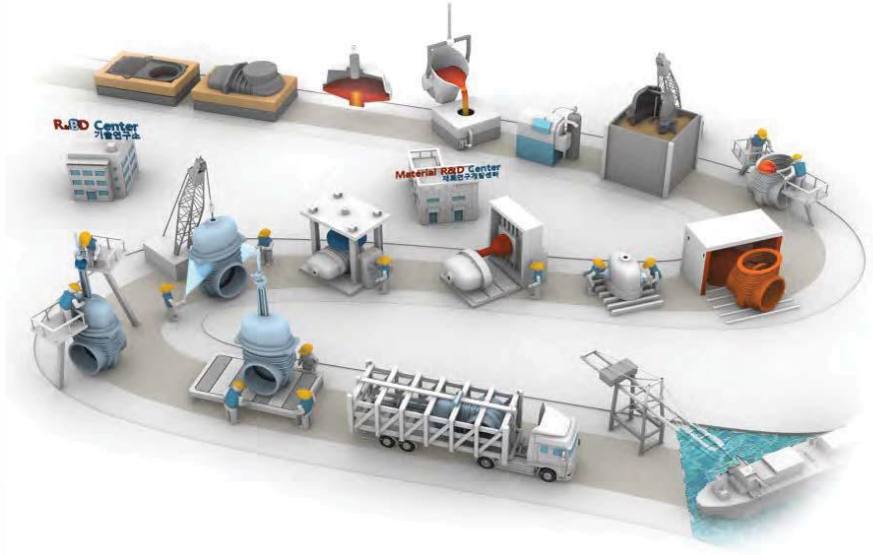
Pre-Qualification

For Power plant Sales
Rev.0 / 2026.07



https://www.pkvne.com

Since 1946 PK Valve & Engineering



PK Valve & Engineering, Korea's first and largest industrial valve company

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05. Catalogue

06. Reference

07. Management System Manual



Positioning as the Global Brand in the next energy industry

01

Company Overview

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Company Overview

1. Outline of Company

Name of Company		PK Valve & Engineering Co., ltd
President		Byun Seong Jin
Location	HQ	(51576) 80 Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, KOREA
	Seoul Sales	(51576) 15-1, Samil-daero 8-gil, Jung-gu, Seoul, KOREA
Estabilished		June 27, 1946
Products		Cast Steel & Forged Steel Valves, UNIT(GVU, FVT), Casting Tube Suppoert
Contact E-mail		Sales Team 1 : sky@pkvne.com Sales Team 3 : jypark@pkvne.com
Total employee		275
Area	Premises size land	69,124 m^2
	Work Shop	18,697 m^2
	Contact Power Plant	6,990 KVA

Company Overview

2. Management Policy

On the basis of "Base on Reliability" as a fundamental management philosophy, all employees at PK Valve Co., Ltd. respect human life and worker's health care before all production activities, provide satisfactory products and services that meet the requirements of customers by means of management activities in harmony with environment and continuing technological development and quality innovations, and further make every efforts to fulfill our social responsibilities and obligations with the realization of human happiness as our top priority, including the policies specified below.



Realization of human happiness

Recognize the Safety, Health, Environment & Quality (SHEQ) management as key factors in accomplishing our continuous stability and growth, and comply with all legal and regulatory requirements, other applicable requirements as agreed and internal regulations that relate to safety, health, environment, and quality aspects.



Providing satisfactory products and services

Improve and upgrade management system continuously through process improvement and technological development so that all the factors impeding safety, health, environment, and quality activities can be minimized.



Continuing Tech. Development Quality innovation development

Establish and implement the management objectives and targets to accomplish our SHEQ management policy, and review and improve the continuing suitability of the management policy and system.

Company Overview

2. Management Policy



Harmony with environment
Worker's health care
Respect human life

Give careful consideration to safety, health, environment, and quality over the whole process ranging from product development, design, production, servicing, and disposal. Make every efforts to prevent accidents by taking precautions to eliminate harmful and dangerous factors involving safety, health, and environment activities, and where an accident occur, take a proper measure to minimize the damage.



Base on reliability

Do our best to earn customer's trust and love by grasping accurately the quality requirements of customer and furnishing the best quality products that always satisfy customer's expectations and requests.



Education and Training

Continuously give training to all PK Valve employees and other representatives who perform safety, health, environment and quality related activities to inspire awareness and induce active participation.

Company Overview

3. History of Company

2025

- Acquired ISO 19443:2018 certification, proving compliance with the highest international standards for nuclear services.
- Recognized as a premier Core Materials, Parts, and Equipment Company for groundbreaking cryogenic hydrogen valve innovation.

2024

- Certified as a Hydrogen Specialized Company
- AEO Certified: Recognized globally for compliance, financial stability, and security excellence.
- First KOLAS-Certified Valve Company: Validated for international-standard testing and inspection.

2023

- Selected as a "World-Class Company": Formally recognized by the Korean government for outstanding technological innovation and global growth potential.

Company Overview

3. History of Company

2022

- Changed company name and logo to PK Valve & Engineering
- Received an award certificate from Minister of the Science and ICT in the ceremony of the 50th anniversary of the Korea Atomic Industrial Forum (KAIF)
- CEO Chun Yeong-chan received an industrial commendation from the Minister of Trade, Industry and Energy at the 2022 Korea Energy Exhibition
- Representative Jeong Young-chan of PK Valve & Engineering Co., Ltd. won the grand prize at the '2022 Gyeongsangnam-do Industrial Peace Award and Best Craftsmanship Ceremony
- Developed a 2 inch emergency shut-off valve for liquefied hydrogen

2021

- Merged previous subsidiary company, “PK SCS”
- Extended a new PK Valve’s butterfly valve factory

2019

- Approved as a qualified vendor to Fluor Corporation
- Minister prize of ‘Korean Ministry of Trade, Industry and Energy’ at the Shin-Kori 3 & 4 nuclear power plant completion ceremony in the recognition of performance of valve supply

Company Overview

3. History of Company

2012

- Received 100 Million Dollar Export Tower Award on 49th Trade Day

2011

- Established Material R&D Center
- Developed high pressure forged steel valve

2009

- Obtained ASME “N” & “NPT” certificates

2007

- Honored with “U$ 70 Millions Achievement Award”
- Awarded by Government for “New Technology Practicality Promotion”.
- Carried out the QME-1 test for NSSS (Nuclear Steam Supply System) by Wyle Laboratories

2006

- Changed company name and logo to PK Valve Co.,Ltd.
- Obtained ISO 14001, OHSAS 18001 by BVQI

Company Overview

3. History of Company

2003

- Joined NSSS (Nuclear Steam Supply System) for Motor Operated Valve as one of the Vendors

1998

- Obtained EM (Excellent Machine, Mechanism and Material) mark for High-Pressure Metal Seat Tilting Check Valve
- Obtained Quality Assurance Qualification certificate by KEPIC

1993

- Listed as a manufacturer for installation of nuclear power plant at KEPCO / ANSI Motor Operated Valve
- Obtained ISO 9001 certificate by BVQI(Bureau Veritas Quality International)

1992

- Listed as a manufacturer for installation of nuclear power

1989

- Listed as a manufacturer for installation of nuclear power plant at KEPCO / Safety Class ASME Valves
- Listed as a manufacturer for installation of thermal & hydroelectric power plant at KEPCO

Company Overview

3. History of Company

1988

- Listed as a manufacturer for installation of nuclear power plant at KEPCO (Korea Electric Power Corporation) / Non-Safety
- Class ANSI B31.1 Valves / Licence No.6
- Obtained certificate of manufacturer for Nuclear Valve by Ministry of Science and Technology, Republic of Korea

1987

- Developed Pressure Seal Type Valves for high pressure and high temperature

1986

- Listed as specialized installation of power plant at KHIC(Korea Heavy Industries & Construction Co., Ltd.) / Listed. No.86-020
- Affiliated as member of KAIF (Korea Atomic Industrial Forum)

1981

- Designated as specialized installation of Power plant by Ministry of Commerce and Industry, Republic of Korea

Company Overview

3. History of Company

* COMMENDATION

No.	DESCRIPTIION	ISSUER	DATE	REMARK
1	Encouragement Award in the nuclear sector at the Energy Awards	Ministry of Trade, Industry and Energy	1999. 06	
2	Commendation for outstanding capital goods development	President award	1999. 10	
3	New technology commercialization promotion contest Government award	Prime Minister	2007. 12	
4	Grand prize for exellent employee's stock ownership plan	Ministry of Employment and Labor	2009. 11	
5	Excellent employment company in Gyeongsangnam-do in 2012	Gyeongsangnam-do	2012. 06	
6	Excellent labor-management culture company in 2012	Ministry of Employment and Labor	2012. 06	
7	The 12th Fair Trade Day Government Award for Men of Merit	Fair Trade Commissioner	2013. 04	
8	Presidential citation for the 40th anniversary of Changwon Industrial Complex designation	President award	2014. 04	
9	Commendation for The 1st Mid-sized Entrepreneur's Day	Ministry of Trade, Industry and Energy	2015. 07	
10	Certificate of Excellent employment company	Gyeongsangnam-do	2017. 12	
11	Commendation for the completion of Shin-Kori Nuclear Power Plant Units 3 and 4	Ministry of Trade, Industry and Energy	2019.12	
12	Commendation for the 50th anniversary of the Korea Nuclear Industry Association	Minister of Science and ICT	2022. 10	
13	Appreciation letter from the President of Korea	President award	2022. 10	
14	Industrial Commendation from the Minister of Trade	Ministry of Trade, Industry and Energ	2022. 10	
15	Grand Prize for Industrial Peace from Korean Government	Gyeongsangnam-do	2022. 12	

Company Overview

3. History of Company

* COMMENDATION

Appreciation letter from the President of Korea



Award of Top Corporate Brand by Korea Enterprises Federation



Top Management Award by the Korea Chamber of Commerce & industry



Appreciation letter from the President of Korea



Industrial Commendation from the Minister of Trade

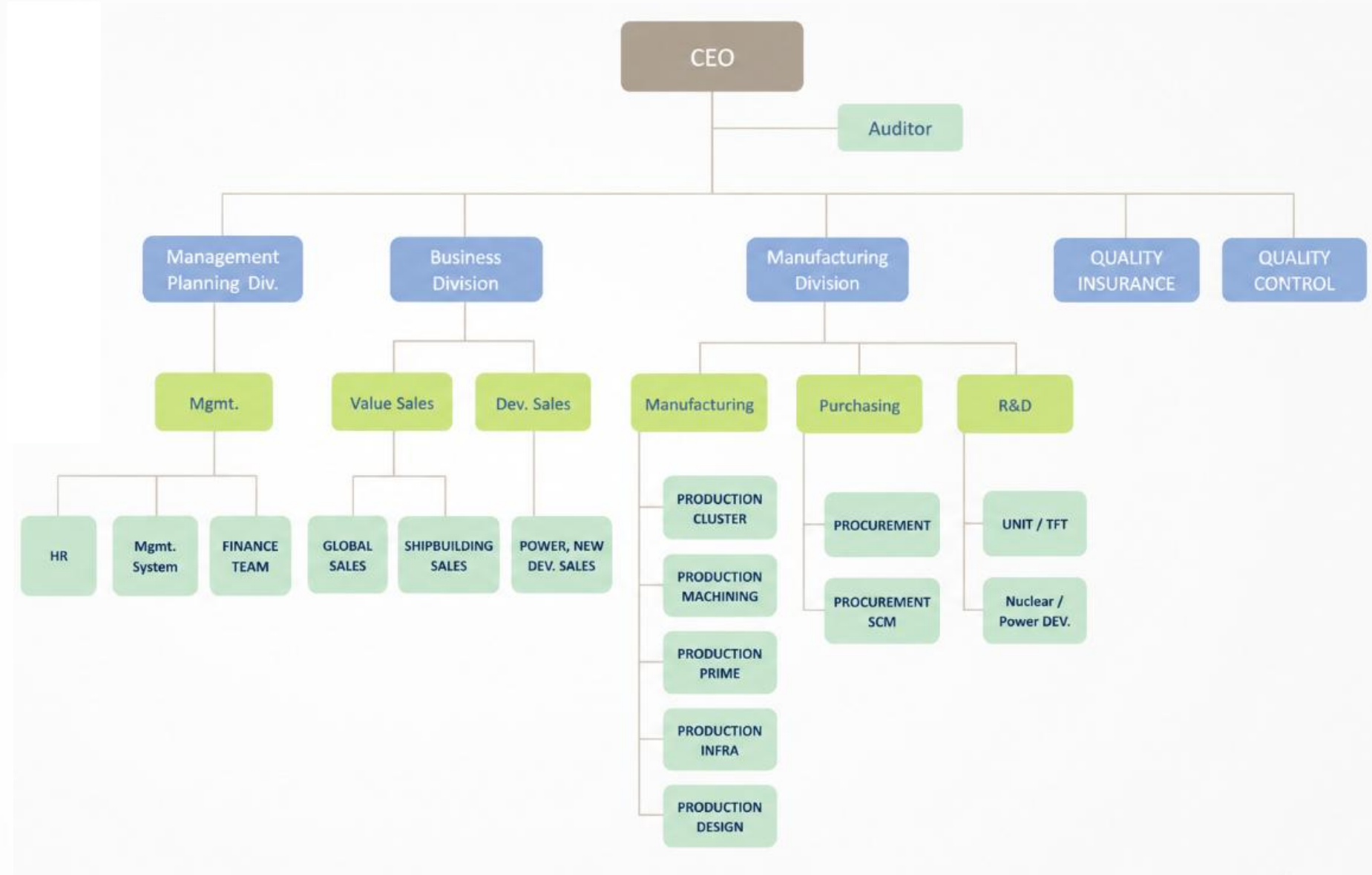


Grand Prize for Industrial Peace from Korean Government



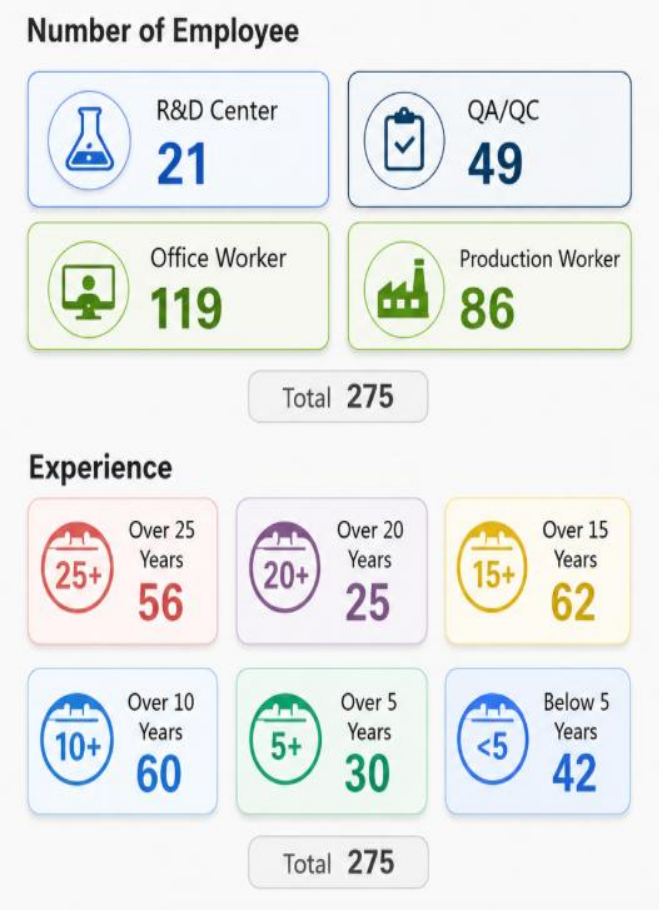
Company Overview

4. Organization



Company Overview

5. Human Resource



R&D Center	21
QA/QC	49
Office Worker	119
Production Worker	86

Over 25 Years	56
Over 20 Years	25
Over 15 Years	62
Over 10 Years	60
Over 5 Years	30
Below 5 Years	42

* Number of NDE Personnel(Resident) : Level 3(1), Lever 2(5) // Total 6 People

02

Business Field

for Nuclear Power Plant



OIL & GAS



PETROCHEMICAL



OFFSHORE



LNG



POWER



Green Energy



Marine Engine

We are growing as a global leader in industrial valves

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Business Field

1. Business Field



Technical Guidance

With technologies and know-how accumulated over several decades, PK VNE gives technical guidance and consulting to the valve manufacturers and customers that require our technology.



New Product Development

PK VNE has a very valuable experience that has developed the products applied to several domestic and foreign plant industries during the past 60 years, and we are also ready to satisfy the needs of valves in the future business design of customer.



Manufacture & Supply

PK VNE manufactures and supplies customer-reliable products with a comprehensive system of valve manufacture including pattern-making plant, casting plant, machining plant, painting plant, laboratory room, R&D division, etc. where we run of our own.



Diagnosis & Repair

PK VNE is performing the repair works on defective products and the diagnosis activities to judge safety, environmental suitability, and efficiency for several industries using valves as well as several customers that habitually use and buy our products.

Business Field

1. Business Field



Inspection & Quality Guidance

Our quality assurance system gives the top priority to the requirements of customer, and has been highly appreciated by customers as most of its own quality control standards are strictly designed and applied. Moreover, we give quality guidance suitable for the quality assurance system to both cooperators and other companies as requested.



Supervision & Witnessing Trial Run

PK VNE can propose an optimization of valve selection or use, and secure high-grade engineers and supervisors who have an ability of immediate solution for valve problems that may be found through witnessing customer's trial run.



Supply of Piping Materials

PK VNE has an agency ability of supplying piping materials, importing valves, and automation facilities of various products except our own ones.



External Training

On the basis of experiences and know-how accumulated, PK Valve gives a regular valve technical training to valve designers, purchasers, inspectors, and operators, and specially provides a chance to see with their own eyes all processes and products of PK VNE.

Business Field

2. Products & Capacity

CAST STEEL

Material	Cast Carbon Steel Cast Alloy Steel / Cast Low Alloy Steel Cast Stainless Steel(Duplex, Super Duplex) Al-Bronze / Hastalloy / Incolloy / Inconel Others
Type	Gate, Parallel slide, Globe, Check, Butterfly, Bellows Seal Valve, Ball
Application	Power Plant(Nuclear, Thermal & Combined Heat) Construction, Housing, General Piping Cryogenic(LNG, LN_2, LO_2, Ethylene, Propylene, LH_2) Chemical / Petrochemical / Oil Refinery Shipping / Offshore Plant Gas Plant / HRSG / Desalination Plant
Size	1 inch ~ 100 inch
Pressure	150LB ~ 2500LB
Specification	ASME/ ANSI , API, KEPIC, ASTM, etc.
Capacity	Cast Carbon Steel Valves / 10,000 ton/year Cast Stainless Steel Valves / 5,000 ton/year **(Total 15,000 ton/year)**

Business Field

2. Products & Capacity

FORGED STEEL

Material	Carbon Steel (A105, A105N) Low Alloy Steel (F11, F22, F91 and etc.)
Type	Gate, Parallel Slide Gate, Globe and Y-Globe, Check
Application	Power Plant(Nuclear, Thermal & Combined Heat) Construction, Housing, General Piping Cryogenic(LNG, LN_2, LO_2, Ethylene, Propylene) Chemical / Petrochemical / Oil Refinery Shipping / Offshore Plant Gas Plant / HRSG / Desalination Plant
Size	1/2 inch ~ 8 inch (For Die Forging) Up to 20 inch (For Free Forging)
Pressure	800LB ~ 4500LB
Specification	ASME/ ANSI , API, KEPIC, ASTM, etc.

Business Field

2. Products & Capacity

CAST STEEL(Ball)

Material	Cast Carbon Steel Cast Alloy Steel / Cast Low Alloy Steel Cast Stainless Steel(Duplex, Super Duplex) Al-Bronze / Others
Type	Split type Ball Valve(2-Piece & 3-Piece), Top Entry Ball Valve End Entry Ball Valve, Weld Entry type DBB(Double-block-and-bleed valve) 3-Way Ball Valve(L-Port, T-Port)
Application	Power Plant(Nuclear, Thermal & Combined Heat) Construction, Housing, General Piping Cryogenic Service(LNG, LN_2, LO_2, Ethylene, Propylene) Chemical / Petrochemical / Oil Refinery Shipping / Offshore Plant(FPSO & LNG Carrier) Gas Plant / HRSG / Desalination Plant MRO Business

Size	1/2inch ~ 80 inch
Pressure	150LB ~ 2500LB
Specification	ASME/ ANSI , API, KEPIC, ASTM, API6D, API6A etc.

Business Field

2. Products & Capacity

FORGED STEEL(Ball)

Material	Carbon Steel (A105(N), LF2) Low Alloy Steel (F11, F22, F91) Stainless Steel (F304(L), F316(L) and etc.
Type	Split type Ball Valve(2-Piece & 3-Piece) & Spol Type
Application	Power Plant(Nuclear, Thermal & Combined Heat) Construction, Housing, General Piping Cryogenic Service(LNG, LN_2, LO_2, Ethylene, Propylene) Chemical / Petrochemical / Oil Refinery Shipping / Offshore Plant(FPSO & LNG Carrier) Gas Plant / HRSG / Desalination Plant MRO Business
Size	1/2 inch ~ 2 inch (For Die Forging) Up to 80 inch (For Free Forging)
Pressure	150LB ~ 4500LB, Spol Valve(API6A)
Specification	ASME/ ANSI , API, KEPIC, ASTM, API6D, API6A etc.

Business Field

2. Products & Capacity

Cryogenic for Liquefied H2

Material	304,316,316L STAINLESS STEEL
Type	GLOBE & GLOBE CHECK TYPE / EXTENDED BONNET
FEATURE	Seat Material : PCTFE of Metal(ESD) Flow Characteristic : Linear of On/Off Position Indicator Type Thermal Barrier Vacuum Jacketed with M.L.I or Non Jacketed Suitable for Cold Box Outside Screw and Yoke Type Easy Maintenance Degreasing Full Penetration Weld(Available Radiographic Testing)

Size	1/2inch ~ 80 inch
Pressure	150LB ~ 2500LB
Specification	As per BS6364 Cold Box

Business Field

2. Products & Capacity

GVU(Gas Valve Unit)

Function

Leak-age test before engine start.
Suppling the gas by engine control system.
Purging with nitrogen before maintenance service.
Quick stop at the end of DF operation mode.
Quick stop in case of an emergency mode.

TECHNICAL SUMMARY

GVU Type : Vertical, Horizontal, Enclosure, Open
Pipe Connection : DN50 ~ DN100
Valve Type : Ball Valves, Axial Valves
Design Pressure : 16 bar
Media Temperature : -25 ~ 60℃
Ambient Temperature : 0 ~ 60℃
Ex Classification : ATEX, IECEx
Compressed Air Pressure : 5 ~ 9bar
Options : Flowmeter, Filter

FEATURES & BENEFITS Valve BV (Ball Valve)

No Welding Design
Easy Maintenance
High Durability
Quick Open/Close
Low Operating Torque
Low Pressure Loss

FEATURES & BENEFITS Valve XV (Axial Valve)

Built-in Actuator
Compact Design
No Welding Design
High Durability
Quick Open/Close
Low Operating Torque

Business Field

3. MAJOR CUSTOM for Power Plant

GLOBAL

وزارة الكهرباء والماء والطاقة المتجددة
Ministry of Electricity & Water & Renewable Energy

الشركة السعودية للكهرباء
Saudi Electricity Company

شركة نواة للطاقة
Nawah Energy Company

CFE
Comisión Federal de Electricidad

EVN

AES

MITSU·ISHI

DUKE ENERGY

Kawasaki

SIEMENS

TECNICAS REUNIDAS

SOUTH KOREA

KHNP

한국전력공사
KOREA ELECTRIC POWER CORPORATION

KOWEPO

GS E&C

DOOSAN Enerbility

KOSEP
KOREA SOUTH-EAST POWER CO.



Business Field

4. Development Items

No.	DESCRIPTIION	DATE	REMARK
1	Bellows Valves	1997	
2	Tilting Check Valves	1997	
3	Metal Seat Ball Valves	1997	
4	Wafer Tilting Check Valves	1997	
5	Low Fugitive Emission Valves	1997	
6	Through Conduit Valves	1997	
7	Top Entry Ball Valves	1998	
8	Double Piston Effect Type Ball Valves	1999	
9	Super Duplex Stainless Steel Valves	1999	
10	Triple Offset Metal Seat Butterfly Valves	2000	
11	Cryogenic Butterfly Valves	2004	
12	Design and Fabrication Technology Development of Co-free Swing Check Valves for High Pressure Service	2005	
13	Cryogenic Shut-off of Butterfly Valves of By-direction Metal Seat Construction for LNG Carrier	2007	

Business Field

4. Development Items

No.	DESCRIPTIION	DATE	REMARK
14	Casting Steel GATE Valve(CL150 Wedge Type 88 inch)	2008	
15	High Pressure Forged steel GATE Valve(CL900 and CL1500, 2, 3 and 4 inch)	2012	
16	High Pressure Forged steel Y-GLOBE Valve(CL900 and CL1500, 2, 3 and 4 inch)	2013	
17	AXIAL CHECK Valve	2014	
18	BLOWDOWN Valve (CBD CL1500 3 inch, IBD CL1500 4 inch)	2014	
19	Casting Steel GATE Valve(CL150 Parallel slide type 92 inch)	2014	
20	High Pressure Forged steel GATE Valve(CL4500 Parallel slide type 20 inch)	2015	
21	2500# Blowdown Valve	2016	
22	900# 24" Cryogenic Ball Valve	2018	
23	Swing Type NRV(Class 150#~900# / Size 10"~42")	2019	
24	Cryogenic Top-Entry Ball Valve	2022	
25	GVU(Gas Valve Unit)	2022	
26	CRYOGENIC VALVE FOR LIQUEFIED H2	2022	

Business Field

5. Patents

No.	DESCRIPTIION	DATE	REMARK
1	Live-load seat-supported cryogenic butterfly valve	2007	
2	Overlay MIG welding device using Inconel 625 wire	2013	
3	Globe check valve for powder transfer	2014	
4	Globe valve with low flow control structure	2018	
5	Butterfly valve with disc slip prevention structure	2018	
6	High differential pressure control valve with pressure offset type cage	2020	
7	High differential pressure regulating valve with pressure offset type flow path	2020	
8	Swing check valve with anti-chattering function	2020	





Positioning as the Global Brand in the next energy industry

03

Capacity

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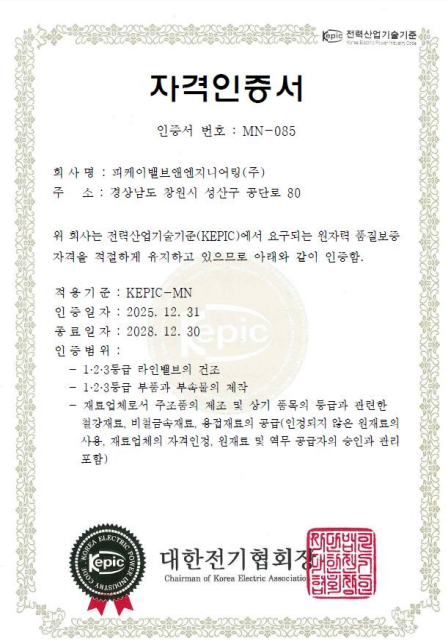
Capacity

1. Certificate

No.	Certificate Name	Publisher	Validity
1	**KEPIC MN - Approved by Korea Electric Association** Scope : Construction of Class 1,2,3 line valve and parts & appurtenance Material organization manufacturing casting Material organization supplying ferrous, nonferrous, and welding materials Certificate Number : MN-085	KEA	2016.12.31 ~
2	**ASME N** Scope : Construction of Class 1, 2 & 3 valves. Certificate Number : N-4797	ASME	2009.12.31 ~
3	**ASME NPT** Scope : Class 1, 2 & 3 fabrication without design responsibility and fabrication with design responsibility for Class 1,2 & 3 appurtenances and as a material organization manufacturing and supplying ferrous & nonferrous material. Certificate Number : N-3361	ASME	2009.12.31 ~
4	**SIL Level 2** Scope : GATE 150, 300, 600, 900, 1500 and 2500 : FS/71/220/14/066 GLOBE 150, 300, 600, 900, 1500 and 2500 : FS/71/220/14/068 BALL 150, 300, 600 and 900 : FS/71/220/14/071 BUTTERFLY 150 and 300 : FS/71/220/14/069	SGS-TUV	2014.12.05 ~
5	**TR-CU** GATE : CGT, PGT, BGT, GTV, SGT, PSG, TCG, KGV, MOV, AOV, GOV, HOV GLOBE : CGL, PGL, PYG, PAG, BGL, GLV, YGL, AGL, SGL, MOV, AOV, GOV, HOV CHECK : CCH, PCH, PTC, CHV, TCH, NRV, LCH BALL : FBA, MOV, AOV, GOV, HOV BUTTERFLY : CBF, TOB, DOB, MOV, AOV, GOV, HOV Certificate No. : RU C-KR.MI-O62.B.01792		2025.06.06 ~ 2030.06.05
6	**CE-PED(2014/68/UE) : Module 'H' - Approved by BV** Scope : Cast steel Gate, Globe, Swing/Tiliting/Lift Check, BF v/v, Ball valve, Forging steel Ball valve, Cryogenic : Gate, Globe, Swing check, Butterfly & Ball valve Certificate Number :CE-0062-PED-H-PKV 002-20-KOR	BV	2023.08.30 ~2026.08.29
7	**ISO 9001:2015/KSA 9001 :2015 - Approved by BV** **ISO 14001:2004/KSA 14001 :2004 - Approved by BV** **ISO 45001:2018 - Approved by BVQI** **ISO 19443:2018 - Approved by KSR**	-	2023.10.28 ~2028.11.06

Capacity

1. Certificate



kepic 전력산업기술기준

자격인증서

인증서 번호 : MN-085

회 사 명 : 피케이밸브엔엔지니어링(주)
주　　소 : 경상남도 창원시 성산구 공단로 80

위 회사는 전력산업기술기준(KEPIC)에서 요구되는 원자력 품질보증 자격을 적절하게 유지하고 있으므로 아래와 같이 인증함.

적 용 기 준 : KEPIC-MN
인 증 일 자 : 2025. 12. 31
종 료 일 자 : 2028. 12. 30
인 증 범 위 :
- 1·2·3등급 라인밸브의 건조
- 1·2·3등급 부품과 부속물의 제작
- 재료업체로서 주조품의 제조 및 상기 품목의 등급과 관련한 철강재료, 비철금속재료, 용접재료의 공급(인정되지 않은 원재료의 사용, 재료업체의 자격인정, 원재료 및 역무 공급자의 승인과 관리 포함)

대한전기협회장
Chairman of Korea Electric Association



ASME NPT

The American Society of Mechanical Engineers

CERTIFICATE OF AUTHORIZATION

The named company is authorized by The American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the ASME Single Certification Mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with the ASME Single Certification Mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

PK Valve & Engineering Co., Ltd.
80, Gongdan-ro, Seongsan-gu
Changwon-si, Gyeongsangnam-do 51567
Republic of Korea

SCOPE:

Class 1, 2 & 3 fabrication without design responsibility and Class 1, 2 & 3 fabrication with design responsibility for appurtenances and furnishing metallic material at the above location only

AUTHORIZED: **June 18, 2024**
EXPIRES: **June 18, 2027**
CERTIFICATE NUMBER: **N-3361**

Gary L. Scribner
Board Chair, Conformity Assessment

Matthew Vaquey
Senior Director, Engineering Operations



ASME N

The American Society of Mechanical Engineers

CERTIFICATE OF AUTHORIZATION

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COMPANY:

PK Valve & Engineering Co., Ltd.
80, Gongdan-ro, Seongsan-gu
Changwon-si, Gyeongsangnam-do 51567
Republic of Korea

SCOPE:

Construction of Class 1, 2 & 3 valves at the above location only

AUTHORIZED: **June 18, 2024**
EXPIRES: **June 18, 2027**
CERTIFICATE NUMBER: **N-4797**

Gary L. Scribner
Board Chair, Conformity Assessment

Matthew Vaquey
Senior Director, Engineering Operations



SGS TÜV SAAR

CERTIFICATE NO FS/71/220/14/0066 PAGE 1/1

LICENCE HOLDER	PK Valve Co., Ltd. 642-370, 80 Gondan-Ro, Seongsan-gu, Changwon-si, Gyeonsangnam-Do, Korea
MANUFACTURING PLANT	PK Valve Co., Ltd. 642-370, 80 Gondan-Ro, Seongsan-gu, Changwon-si, Gyeonsangnam-Do, Korea
PROJECT NO/-ID	H1GS
LICENSED TEST MARK	SGS TÜV SAAR FUNCTIONAL SAFETY APPROVED
CERT. REPORT NO.	H1GS0001
Tested according to	IEC 61508:2010 Ed.2
Certified product(s)	Gate Valves
Model(s)	ANSI Class 150, 300, 600, 900, 1500, 2500 (details refer to H1GS0001)
Technical Data and Parameter	The products fulfill the requirements of functional safety acc. to IEC 61508. The products can be used with a hardware fault tolerance HFT = 0, e.g. in a 1oo1- architecture up to SIL 2 and with HFT ≥ 1, e.g. in an 1oo2 architecture up to SIL 3.
Specific Requirements	This certificate confirms the achievement of the requirements of functional safety based on the following proofs: - Proof of systematic safety integrity for defined phases of the life cycle - Proof of the required safety-related parameters (failure rate, PFD and SFF by means of FMEDA) - Proofs that processes and methods are established at the manufacturer guaranteeing that unexceptionable processes in terms of risk analysis, design, production, validation, change management and quality management comply with the safety-related standard (see H1GS0001).

Certification Body for Functional Safety SGS-TÜV Saar GmbH
Munich, 2014-12-05
Robert Sammer



SGS TÜV SAAR

CERTIFICATE NO FS/71/220/14/0068 PAGE 1/1

LICENCE HOLDER	PK Valve Co., Ltd. 642-370, 80 Gongdan-Ro, Seongsan-gu, Changwon-si, Gyeonsangnam-Do, Korea
MANUFACTURING PLANT	PK Valve Co., Ltd. 642-370, 80 Gondan-Ro, Seongsan-gu, Changwon-si, Gyeonsangnam-Do, Korea
PROJECT NO/-ID	H1GS
LICENSED TEST MARK	SGS TÜV SAAR FUNCTIONAL SAFETY APPROVED
CERT. REPORT NO.	H1GS0003
Tested according to	IEC 61508:2010 Ed.2
Certified product(s)	Globe Valves
Model(s)	ANSI Class 150, 300, 600, 900, 1500, 2500 (details refer to H1GS0003)
Technical Data and Parameter	The products fulfill the requirements of functional safety acc. to IEC 61508. The products can be used with a hardware fault tolerance HFT = 0, e.g. in a 1oo1- architecture up to SIL 2 and with HFT ≥ 1, e.g. in an 1oo2 architecture up to SIL 3.
Specific Requirements	This certificate confirms the achievement of the requirements of functional safety based on the following proofs: - Proof of systematic safety integrity for defined phases of the life cycle - Proof of the required safety-related parameters (failure rate, PFD and SFF by means of FMEDA) - Proofs that processes and methods are established at the manufacturer guaranteeing that unexceptionable processes in terms of risk analysis, design, production, validation, change management and quality management comply with the safety-related standard (see H1GS0003).

Certification Body for Functional Safety SGS-TÜV Saar GmbH
Munich, 2014-12-05
Robert Sammer



SGS TÜV SAAR

CERTIFICATE NO FS/71/220/14/0071 PAGE 1/1

LICENCE HOLDER	PK Valve Co., Ltd. 642-370, 80 Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea
MANUFACTURING PLANT	PK Valve Co., Ltd. 642-370, 80 Gondan-Ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea
PROJECT NO/-ID	H1GS
LICENSED TEST MARK	SGS TÜV SAAR FUNCTIONAL SAFETY APPROVED
CERT. REPORT NO.	H1GS0005
Tested according to	IEC 61508:2010 Ed.2
Certified product(s)	Ball Valves
Model(s)	ANSI Class 150, 300, 600 and 900 (details refer to H1GS0005)
Technical Data and Parameter	The products fulfill the requirements of functional safety acc. to IEC 61508. The products can be used with a hardware fault tolerance HFT = 0, e.g. in a 1oo1- architecture up to SIL 2 and with HFT ≥ 1, e.g. in an 1oo2 architecture up to SIL 3.
Specific Requirements	This certificate confirms the achievement of the requirements of functional safety based on the following proofs: - Proof of systematic safety integrity for defined phases of the life cycle - Proof of the required safety-related parameters (failure rate, PFD and SFF by means of FMEDA) - Proofs that processes and methods are established at the manufacturer guaranteeing that unexceptionable processes in terms of risk analysis, design, production, validation, change management and quality management comply with the safety-related standard (see H1GS0005).

Certification Body for Functional Safety SGS-TÜV Saar GmbH
Munich, 2014-12-19
Gudrun Neumann



SGS TÜV SAAR

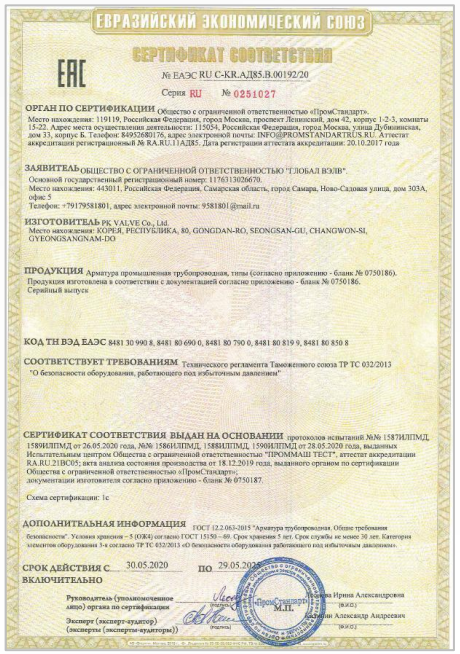
CERTIFICATE NO FS/71/220/14/0069 PAGE 1/1

LICENCE HOLDER	PK Valve Co., Ltd. 642-370, 80 Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-Do, Korea
MANUFACTURING PLANT	PK Valve Co., Ltd. 642-370, 80 Gondan-Ro, Seongsan-gu, Changwon-si, Gyeonsangnam-Do, Korea
PROJECT NO/-ID	H1GS
LICENSED TEST MARK	SGS TÜV SAAR FUNCTIONAL SAFETY APPROVED
CERT. REPORT NO.	H1GS0004
Tested according to	IEC 61508:2010 Ed.2
Certified product(s)	Butterfly Valves
Model(s)	ANSI Class 150 and 300, (details refer to H1GS0004)
Technical Data and Parameter	The products fulfill the requirements of functional safety acc. to IEC 61508. The products can be used with a hardware fault tolerance HFT = 0, e.g. in a 1oo1- architecture up to SIL 2 and with HFT ≥ 1, e.g. in an 1oo2 architecture up to SIL 3.
Specific Requirements	This certificate confirms the achievement of the requirements of functional safety based on the following proofs: - Proof of systematic safety integrity for defined phases of the life cycle - Proof of the required safety-related parameters (failure rate, PFD and SFF by means of FMEDA) - Proofs that processes and methods are established at the manufacturer guaranteeing that unexceptionable processes in terms of risk analysis, design, production, validation, change management and quality management comply with the safety-related standard (see H1GS0004).

Certification Body for Functional Safety SGS-TÜV Saar GmbH
Munich, 2014-12-05
Robert Sammer

Capacity

1. Certificate


ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ЕАЭС RU C-KR.АД85.В.00192/20

Серия RU № 0251027

ОРГАН ПО СЕРТИФИКАЦИИ Общество с ограниченной ответственностью «ПромСтандарт».
Место нахождения: 119119, Российская Федерация, город Москва, проспект Ленинский, дом 42, корпус 1-2-3, комнаты 13-22. Адрес места осуществления деятельности: 115054, Российская Федерация, город Москва, улица Дубининская, дом 33, корпус Б. Телефон: 84952680176, адрес электронной почты: INFO@PROMSTANDARTRUS.RU. Аттестат аккредитации регистрационный № RA.RU.11АД85. Дата регистрации аттестата аккредитации: 20.10.2017 года

ЗАЯВИТЕЛЬ ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ "ГЛОБАЛ ВЭЛВ".
Основной государственный регистрационный номер: 1176313026670.
Место нахождения: 443011, Российская Федерация, Самарская область, город Самара, Ново-Садовая улица, дом 303А, офис 5
Телефон: +79179581801, адрес электронной почты: 9581801@mail.ru

ИЗГОТОВИТЕЛЬ PK VALVE Co., Ltd.
Место нахождения: КОРЕЯ, РЕСПУБЛИКА, 80, GONGDAN-RO, SEONGSAN-GU, CHANGWON-SI, GYEONGSANGNAM-DO

ПРОДУКЦИЯ Арматура промышленная трубопроводная, типы (согласно приложению - бланк № 0750186).
Продукция изготовлена в соответствии с документацией согласно приложению - бланк № 0750186.
Серийный выпуск

КОД ТН ВЭД ЕАЭС 8481 30 990 8, 8481 80 690 0, 8481 80 790 0, 8481 80 819 9, 8481 80 850 8

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ Технического регламента Таможенного союза ТР ТС 032/2013
"О безопасности оборудования, работающего под избыточным давлением"

СЕРТИФИКАТ СООТВЕТСТВИЯ ВЫДАН НА ОСНОВАНИИ протоколов испытаний №№ 1587ИЛПМД, 1589ИЛПМД от 26.05.2020 года, №№ 1586ИЛПМД, 1588ИЛПМД, 1590ИЛПМД от 28.05.2020 года, выданных Испытательным центром Общества с ограниченной ответственностью "ПРОМАШ ТЕСТ", аттестат аккредитации RA.RU.21ВС05; акта анализа состояния производства от 18.12.2019 года, выданного органом по сертификации Общества с ограниченной ответственностью «ПромСтандарт»;
документации изготовителя согласно приложению - бланк № 0750187.

Схема сертификации: 1с

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ ГОСТ 12.2.063-2015 "Арматура трубопроводная. Общие требования безопасности". Условия хранения – 5 (ОЖ4) согласно ГОСТ 15150—69. Срок хранения 5 лет. Срок службы не менее 30 лет. Категория элементов оборудования 3-я согласно ТР ТС 032/2013 «О безопасности оборудования работающего под избыточным давлением».

СРОК ДЕЙСТВИЯ С 30.05.2020 ПО 29.05.2025
ВКЛЮЧИТЕЛЬНО

Руководитель (уполномоченное лицо) органа по сертификации — Леонтьева Ирина Александровна
Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) — Кабанов Александр Андреевич

М.П.

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

ПРИЛОЖЕНИЕ

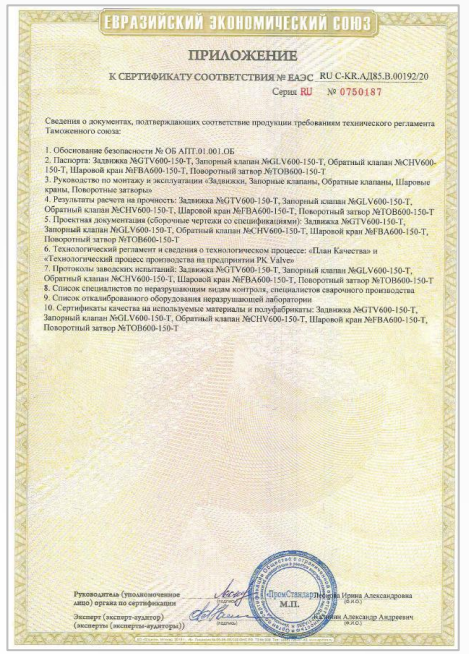
К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС RU C-KR.АД85.В.00192/20

Серия RU № 0750186

КОД ТН ВЭД ЕАЭС	Наименование, типы, марки, модели однородной продукции, системные изделия или комплекса	Обозначение документации, в соответствии с которой выпускается продукция
	Арматура промышленная трубопроводная, типы:	
8481 80 690 0	Задвижки (Gate valve), модели: CGT, PGT, BGT, GTV, SGT, PSG, TCG, KGV, DN до 2400 (до 96"); PN до 420MPa (Class 2500)	ASME B16.34 «Арматура фланцевая, резьбовая и под приварку»; API 600:2015 «Задвижки стальные фланцевые и под приварку, с крышками на болтах»; API 602: 2015 «Задвижки, Запорные клапаны и Обратные клапаны для трехпроводов NPS 4 (DN 100) и меньше для нефтяной и газовой промышленности»; API 603:2013 «Задвижки коррозионностойкие, с крышками на болтах – с фланцевые и под приварку»; API Spec 6D: 2014 «Спецификация на трубопроводы и Арматуру трубопроводную»; ASME B16.10 «Арматура, строительные длины, размеры присоединений»; ASME B16.5 «Фланцы и фланцевые фитинги»; ASME B16.47 «Фланцы стальные большого диаметра»; ASME B16.25 «Патрубки под приварку встык».
8481 80 790 0	Запорные клапаны (Globe valve), модели: CGL, PGL, PYG, PAG, BGL, GLV, YGL, AGL, SGL, DN до 600 (до 24"), PN до 42MPa (Class 2500)	ASME B16.34 «Арматура фланцевая, резьбовая и под приварку»; BS 1873 «Стальные Запорные клапаны и некоторые запорные клапаны (фланцевые и под приварку) для нефтяной, нефтехимической и смежных отраслей промышленности»; ASME B16.10 «Арматура, строительные длины, размеры присоединений»; ASME B16.5 «Фланцы и фланцевые фитинги»; ASME B16.25 «Патрубки под приварку встык».
8481 30 990 8	Обратные клапаны (Check valve), модели: CCL, PCH, PTC, CHV, TCH, LCH, SCH, NRV, DCH, XCV, DN до 1400 (до 56"), PN до 42MPa (Class 2500)	ASME B16.34 «Арматура фланцевая, резьбовая и под приварку»; API Spec 6D: 2014 «Спецификация на трубопроводы и Арматуру трубопроводную»; BS 1868 «Стальные Обратные клапаны (фланцевые и под приварку) для нефтяной, нефтехимической и смежных отраслей промышленности»; API 594: 2017 «Обратные клапаны: фланцевые, с проушинами, межфланцевые и под приварку»; ASME B16.10 «Арматура, строительные длины, размеры присоединений»; ASME B16.5 «Фланцы и фланцевые фитинги»; ASME B16.47 «Фланцы стальные большого диаметра»; ASME B16.25 «Патрубки под приварку встык».
8481 80 819 9	Шаровые краны (Ball valve), модели: CBA, FBA, TBA, WBA, 3BA, SBA, DBB, MFV, DN до 1400 (до 56"), PN до 42MPa (Class 2500)	ASME B16.34 «Арматура фланцевая, резьбовая и под приварку»; API Spec 6D: 2014 «Спецификация на трубопроводы и Арматуру трубопроводную»; ASME B16.10 «Арматура, строительные длины, размеры присоединений»; ASME B16.5 «Фланцы и фланцевые фитинги»; ASME B16.47 «Фланцы стальные большого диаметра»; ASME B16.25 «Патрубки под приварку встык».
8481 80 850 8	Поворотные затворы (Butterfly Valve), модели: CHF, C08, D08, T08, DN до 2000 (до 80"), PN до 10MPa (Class 600)	ASME B16.34 «Арматура фланцевая, резьбовая и под приварку»; API 609: 2016 «Поворотные затворы: фланцевые, с проушинами и межфланцевые»; ASME B16.10 «Арматура, строительные длины, размеры присоединений»; ASME B16.5 «Фланцы и фланцевые фитинги»; ASME B16.47 «Фланцы стальные большого диаметра»; ASME B16.25 «Патрубки под приварку встык».

Руководитель (уполномоченное лицо) органа по сертификации — Леонтьева Ирина Александровна
Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) — Кабанов Александр Андреевич

М.П.


ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

ПРИЛОЖЕНИЕ

К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС RU C-KR.АД85.В.00192/20

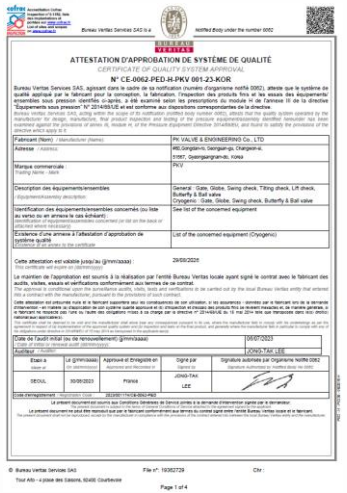
Серия RU № 0750187

Сведения о документах, подтверждающих соответствие продукции требованиям технического регламента Таможенного союза:

1. Обоснование безопасности № ОБ АПТ.01.001.ОБ
2. Паспорта: Задвижка №GTV600-150-T, Запорный клапан №GLV600-150-T, Обратный клапан №CHV600-150-T, Шаровой кран №FBA600-150-T, Поворотный затвор №TOB600-150-T
3. Руководство по монтажу и эксплуатации «Задвижки, Запорные клапаны, Обратные клапаны, Шаровые краны, Поворотные затворы»
4. Результаты расчета на прочность: Задвижка №GTV600-150-T, Запорный клапан №GLV600-150-T, Обратный клапан №CHV600-150-T, Шаровой кран №FBA600-150-T, Поворотный затвор №TOB600-150-T
5. Проектная документация (сборочные чертежи со спецификациями): Задвижка №GTV600-150-T, Запорный клапан №GLV600-150-T, Обратный клапан №CHV600-150-T, Шаровой кран №FBA600-150-T, Поворотный затвор №TOB600-150-T
6. Технологический регламент и сведения о технологическом процессе: «План Качества» и «Технологический процесс производства на предприятии PK Valve»
7. Протоколы заводских испытаний: Задвижка №GTV600-150-T, Запорный клапан №GLV600-150-T, Обратный клапан №CHV600-150-T, Шаровой кран №FBA600-150-T, Поворотный затвор №TOB600-150-T
8. Список специалистов по неразрушающим видам контроля, специалистов сварочного производства
9. Список откалиброванного оборудования неразрушающей лаборатории
10. Сертификаты качества на используемые материалы и полуфабрикаты: Задвижка №GTV600-150-T, Запорный клапан №GLV600-150-T, Обратный клапан №CHV600-150-T, Шаровой кран №FBA600-150-T, Поворотный затвор №TOB600-150-T

Руководитель (уполномоченное лицо) органа по сертификации — Леонтьева Ирина Александровна
Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) — Кабанов Александр Андреевич

М.П.


ATTESTATION D'APPROBATION DE SYSTÈME DE QUALITÉ

CERTIFICATE OF QUALITY SYSTEM APPROVAL

N° CE-0062-PED-H-PKV 001-23-KOR

Bureau Veritas Services SAS, agissant dans le cadre de sa notification (numéro d'organisme notifié 0062), atteste que le système de qualité appliqué par le fabricant pour la conception, la fabrication, l'inspection des produits finis et les essais des équipements/ensembles sous pression identifiés ci-après, à été examiné selon les prescriptions du module H de l'annexe III de la directive "Equipements sous pression" N° 2014/68/UE et est conforme aux dispositions correspondantes de la directive.

Fabricant (Nom)	PK VALVE & ENGINEERING Co., LTD
Adresse	#80, Gongdan-ro, Seongsan-gu, Changwon-si, 51567, Gyeongsangnam-do, KOREA
Marque commerciale	PKV
Description des équipements/ensembles	General : Gate, Globe, Swing check, Tilting check, Lift check, Butterfly & Ball valve Cryogenic : Gate, Globe, Swing check, Butterfly & Ball valve
Identification des équipements/ensembles concernés (ou liste au verso ou en annexe le cas échéant)	See list of the concerned equipment
Existence d'une annexe à l'attestation d'approbation de système qualité	List of the concerned equipment (Cryogenic)

Cette attestation est valable jusqu'au (jj/mm/aaaa) : 29/08/2026

Le maintien de l'approbation est soumis à la réalisation par l'entité Bureau Veritas locale ayant signé le contrat avec le fabricant des audits, visites, essais et vérifications conformément aux dispositions de ce contrat.

Date de l'audit initial (ou de renouvellement) (jj/mm/aaaa): 05/07/2023

Auditeur: JONG-TAK LEE

Etabli à	Le (jj/mm/aaaa)	Approuvé et Enregistré en	Signé par	Signature autorisée par Organisme Notifié 0062
SEOUL	30/08/2023	France	JONG-TAK LEE	

Page 1 of 4


Bureau Veritas Certification

PK VALVE & ENGINEERING Co., LTD.

#80, Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea, 51567

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 9001:2015

Scope of certification

DESIGN/DEVELOPMENT, PRODUCTION AND SERVICING OF GATE, GLOBE, CHECK, BALL, PLUG, BUTTERFLY VALVE & VALVE UNIT AND STEEL CASTING

Original cycle start date:	21-09-1993
Expiry date of previous cycle:	NA
Certification / Recertification Audit date:	NA
Certification / Recertification cycle start date:	26-10-2023
Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on:	28-10-2026
Certificate No.: KR003880	Version: 1
Issue date: 26-10-2023	

Signed on behalf of BVCH SAS UK Branch

Certification body address: 5th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom

Local Office: 5th Floor, 497 Bongeunsa-ro, Gangnam-gu, Seoul, Republic of Korea, 06054

Further clarifications regarding the scope and validity of this certificate, and the applicability of the management system requirements, please call: +82 2 555 0910

UKAS Certificate Template Single Site Rev. 5.10

1/1

22 Mar 2023


Bureau Veritas Certification

PK VALVE & ENGINEERING Co., LTD.

#80, Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea, 51567

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 14001:2015

Scope of certification

DESIGN/DEVELOPMENT, PRODUCTION AND SERVICING OF GATE, GLOBE, CHECK, BALL, PLUG & BUTTERFLY VALVE & VALVE UNIT AND STEEL CASTING

Original cycle start date:	16-11-2005
Expiry date of previous cycle:	NA
Certification / Recertification Audit date:	NA
Certification / Recertification cycle start date:	28-10-2023
Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on:	28-10-2026
Certificate No.: KR003898	Version: 1
Issue date: 28-10-2023	

Signed on behalf of BVCH SAS UK Branch

Certification body address: 5th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom

Local Office: 5th Floor, 497 Bongeunsa-ro, Gangnam-gu, Seoul, Republic of Korea, 06054

Further clarifications regarding the scope and validity of this certificate, and the applicability of the management system requirements, please call: +82 2 555 0910

UKAS Certificate Template Single Site Rev. 5.10

1/1

22 Mar 2023


Bureau Veritas Certification

PK VALVE & ENGINEERING Co., LTD.

#80, Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea, 51567

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 45001:2018

Scope of certification

DESIGN/DEVELOPMENT, PRODUCTION AND SERVICING OF GATE, GLOBE, CHECK, BALL, PLUG & BUTTERFLY VALVE & VALVE UNIT AND STEEL CASTING

Original cycle start date:	16-11-2020
Expiry date of previous cycle:	NA
Certification / Recertification Audit date:	NA
Certification / Recertification cycle start date:	28-10-2023
Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on:	15-11-2026
Certificate No.: KR003899	Version: 1
Issue date: 28-10-2023	

Signed on behalf of BVCH SAS UK Branch

Certification body address: 5th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom

Local Office: 5th Floor, 497 Bongeunsa-ro, Gangnam-gu, Seoul, Republic of Korea, 06054

Further clarifications regarding the scope and validity of this certificate, and the applicability of the management system requirements, please call: +82 2 555 0910

UKAS Certificate Template Single Site Rev. 5.10

1/1

22 Mar 2023


KSR

Certificate of
Quality Management System for Supply Chain of
The Nuclear Energy Sector

This is to certify that Quality Management System for Supply Chain of The Nuclear Energy Sector of

PK Valve&Engineering Co., Ltd.

80 Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Republic of Korea

applicable to

Manufacturer of the Design, Manufacturing, and Service of Valve in Nuclear Power Plants

has been assessed and registered by Korea Knowledge Standards Registrar Company Limited against the provisions of

ISO 19443:2018

The registration is subject to the company maintaining a Quality management system for supply chain of the nuclear energy sector in the above standard, which will be monitored by Korea Knowledge Standards Registrar.

Certificate No.	Original Approval Date
NQMC-0035	07-Nov-2025
Expiry Date	
07-Nov-2025 ~ 06-Nov-2028	

President Jang Sub Kim

KAB-MQ-01

Korea Knowledge Standards Registrar was accredited as Quality Management System for Supply Chain of The Nuclear Energy Sector certification body (Accreditation Number: KAB-MQ-01) by Korea Accreditation Board(KAB).

This certificate is the property with Korea Knowledge Standards Registrar. Use, if required, you should return at once.

To verify the validity of the certificate, please scan the QR code and search for the company name.

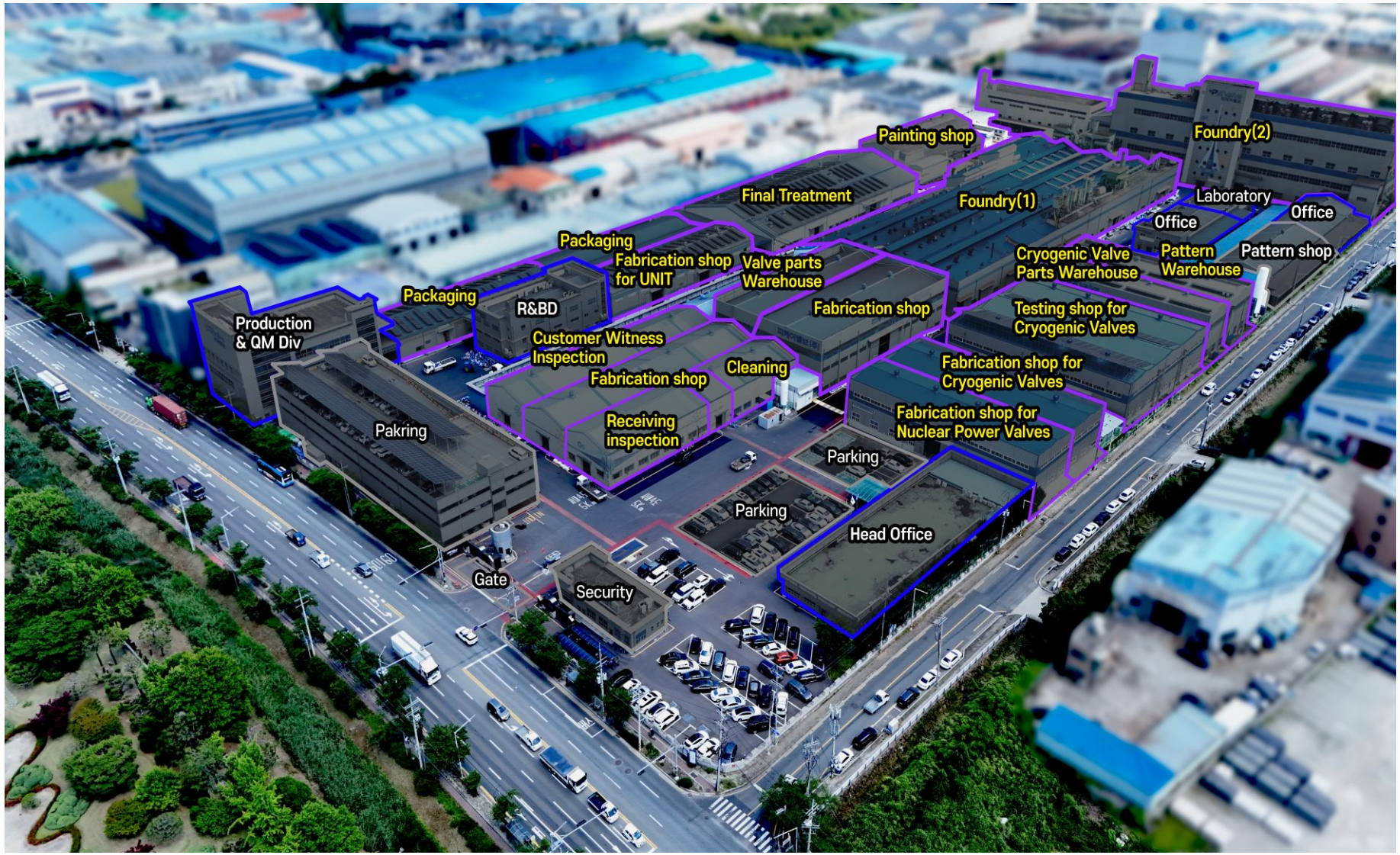
[illegible]

Capacity

2. Facility

PK E-TOUR LINK

https://www.pkvne.com/VRTour/index.html



Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
CASTING	FURNACE	3 ton	2ea	
		1 ton	2ea	
		350 kg	1ea	
		5 kg	1ea	For testing
	VRH Molding Line	-	1 Line	
	Heat Treatment Furnace	30 ton	1ea	
		10 ton	2ea	
		4 ton	2ea	
	Molding Machine	-	7ea	
	Mixer	-	4ea	
	Shot Blast Machine	-	11ea	
	Gear Laddle	5 ton - 6 ton	12ea	
	Welding Rod Dryer	500 kg - 1,000 kg	6ea	
	band saw	-	5ea	
	Boring Machine(CNC)	-	7ea	
MACHINING	Milling Machine	500-1500kgf.cm	4ea	
	Lathe(Horizontal)	-	28ea	
	Lathe(Vertical)	-	1ea	
	Planar	-	1ea	
	Slotter	-	1ea	
	Shaper	-	1ea	
	Drilling Machine : Bench type	-	8ea	
	Drilling Machine : Radial type	-	12ea	

Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
MACHINING	Welding Machine : Mig	-	19ea	
	Welding Machine : Tig	-	28ea	
	Welding Machine : Arc	-	26ea	
	Welding Machine : Gauging	-	8ea	
	Welding Machine : Spot	-	3ea	
	Welding Machine : Plasma	-	3ea	
	Lapping Machine	-	4ea	
	Automatic Painting System	-	3Line	
	Paint Booth	-	3ea	
	Air Less	-	3ea	
	Hydraulic TorqueWrench	-	6ea	
	High Pressure Gas Compressor	Cryogenic	6ea	
	BFV fabrication bed	S, M, L	2ea	
	BFV hydraulic actuator	-	5ea	
	Spot Facing Machine	-	6ea	
	Automatic Washing Device	-	2ea	
	Welding Turn Table	300 kg - 1,000 kg	6ea	
	Screw Compressor	50HP – 215HP	9ea	
	GVU Test Equipment	-	1ea	
	V/V function test machine	24" and below	1ea	
LIFTING EQUIPMENT	Crane & Hoist	1 ton	73ea	
		2 ton	25ea	
		2.8 ton	21ea	

Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
LIFTING EQUIPMENT	Crane & Hoist	3 ton	36ea	
		5 ton	33ea	
		10 ton	20ea	
		30 ton	6ea	
DUST COLLECTOR	Bag filter	-	31ea	
	AC Tower	-	10ea	
	Local Exhaust Ventilation	-	6ea	
	Portable Bag filter	-	22ea	
	Cyclone Dust Collector	-	9ea	
HAULAGE EQUIPMENT	Folk-Lift	2.5ton (electric)	31ea	
		3.5ton (engine)	1ea	
		scissor lift	1ea	
CHEMICAL ANALYSIS	Spectrometer (ARL 3460)	Lab. Equip.	1ea	SS/AS/DS etc
	X-met 3000,5000,7000 series (Oxford)	Protable	3ea	SS/AS etc
	PMI Master pro (Oxford)	Protable	1ea	SS/AS etc
IMPACT TEST	SHARPY IMPACT TESTER	0-30kgf.m	1ea	Cali. By NIST
VOLT/AMPER	DIGITAL CLAMP TESTER	1000V/1000A	1ea	
	CLAMP TESTER	600V/2000A	1ea	
	AMPER METER	600A, etc	51ea	
	VOLT METER	150V, etc	51ea	
LENGTH (Length, Depth, Thickness)	DIAL GAUGE	0.01-10mm	10ea	
	THICKNESS GAUGE	0.1-80mm	2ea	
	GAUGE BLOCK	32BON	1ea	

Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
LENGTH (Length, Depth, Thickness)	HEIGHT GAUGE	0-300mm	3ea	
	HEIGHT GAUGE	0-600mm	2ea	
	HEIGHT GAUGE	0-1000mm	1ea	
	HEIGHT GAUGE(DIGITAL)	0-300mm	1ea	
	HEIGHT GAUGE(DIGITAL)	0-600mm	2ea	
	INSIDE MICROMETER	0-500mm	2ea	
	INSIDE MICROMETER	50-1500mm	1ea	
	OUTSIDE MICROMETER	0-150mm	1ea	
	OUTSIDE MICROMETER	150-300mm	1ea	
	OUTSIDE MICROMETER	300-400mm	1ea	
	OUTSIDE MICROMETER	400-500mm	1ea	
	OUTSIDE MICROMETER	500-600mm	1ea	
	OUTSIDE MICROMETER	1000-1200mm	1ea	
	VERNIER CALIPERS	0-150mm	3ea	
	VERNIER CALIPERS(DIGITAL)	0-150mm	2ea	
	VERNIER CALIPERS	0-200mm	10ea	
	VERNIER CALIPERS(DIGITAL)	0-200mm	8ea	
	VERNIER CALIPERS (Depth)	0-200mm	1ea	
	VERNIER CALIPERS (DIGITAL) Depth	0-200mm	1ea	
	VERNIER CALIPERS	0-300mm	54ea	
	VERNIER CALIPERS(DIGITAL)	0-300mm	10ea	
	VERNIER CALIPERS(DIGITAL) Depth	0-300mm	1ea	
	VERNIER CALIPERS (Depth)	0-300mm	1ea	

Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
LENGTH (Length, Depth, Thickness)	VERNIER CALIPERS	0-600mm	24ea	
	VERNIER CALIPERS(DIGITAL)	0-600mm	1ea	
	VERNIER CALIPERS (Depth)	0-600mm	1ea	
	VERNIER CALIPERS	0-1000mm	8ea	
	VERNIER CALIPERS	0-1500mm	4ea	
	VERNIER CALIPERS(DIAL)	0 -600mm	1ea	
HARDNESS	Brinell Hardness	0 ~ 450 HB	2ea	
	Micro-Vickers / Vickers Hardness	0.01~1/1~50 kgf	2ea	
	Portable Hardness	HB/HL	2ea	
FLOW LATE	ROTA METER	0-100cc/min	1ea	
	ROTA METER	0 ~ 250 cc/min	3ea	
ANGLE	BEVEL PROTRECTOR	0-90'	1ea	
	COMBINETION SQURE	0-180'	1ea	
FORCE/TORQUE	TENSION TESTER	0-50TON	1ea	
	TORQUE WRENCH	0-9.8 N-m	1ea	
	TORQUE WRENCH	0-19 N-m	1ea	
	TORQUE WRENCH	5-25 N-m	1ea	
	TORQUE WRENCH	0-49 N-m	1ea	
	TORQUE WRENCH	0-98 N-m	1ea	
	TORQUE WRENCH	30-140 N-m	5ea	
	TORQUE WRENCH	0-196 N-m	1ea	
	TORQUE WRENCH	0-210 N-m	2ea	
	TORQUE WRENCH	0-353 N-m	1ea	

Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
FORCE /TORQUE	TORQUE WRENCH	40-280 N-m	2ea	
	TORQUE WRENCH	60-420 N-m	2ea	
	TORQUE WRENCH	10-500 N-m	2ea	
	TORQUE WRENCH	100-750 N-m	1ea	
	TORQUE WRENCH	100-850 N-m	1ea	
	TORQUE WRENCH	100-1000 N-m	1ea	
	TORQUE WRENCH	20-140 Kg-m	1ea	
	TORQUE WRENCH	200-1000 Kg-m	1ea	
TEMPERATURE	HIGRO-THERMOMETER	50℃	1ea	
	DIGITAL THERMOMETER	-200 - 1600℃	2ea	
	TEMPERATURE RECORD	0 - 1600℃	4ea	
	OPTICAL TEMPERATURE	800 - 1800℃	3ea	
	THERMO METER	600 - 1200℃	8ea	
	TEMPERATURE CONTROL INDICATOR	0 - 200℃	1ea	
	TEMPERATURE CONTROL INDICATOR	0 - 400℃	3ea	
	TEMPERATURE CONTROL INDICATOR	0 - 600℃	2ea	
	TEMPERATURE CONTROL INDICATOR	0 - 1700℃	1ea	
	THERMO COUPLE (K TYPE)	0 - 600℃	5ea	
	THERMO COUPLE (K TYPE)	0 - 1200℃	6ea	
	THERMO COUPLE (K TYPE)	600 - 1200℃	10ea	
	THERMO COUPLE (R TYPE)	600 - 1200℃	13ea	
PRESSURE	DEAD WEIGHT TESTER	5 - 500kgf/㎠	1set	
	PRESSURE GAUGE	0 -76CmHg	1ea	

Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
PRESSURE	PRESSURE GAUGE	0 - 10kgf/㎠	4ea	
	PRESSURE GAUGE	0 - 15kgf/㎠	15ea	
	PRESSURE GAUGE	0 - 25kgf/㎠	8ea	
	PRESSURE GAUGE	0 - 50kgf/㎠	19ea	
	PRESSURE GAUGE	0 - 100kgf/㎠	9ea	
	PRESSURE GAUGE	0 - 150kgf/㎠	19ea	
	PRESSURE GAUGE	0 - 250kgf/㎠	22ea	
	PRESSURE GAUGE	0 - 500kgf/㎠	15ea	
	PRESSURE GAUGE	0 - 1000kgf/㎠	11ea	
LENGTH	Venire Calipers	0 ~ 1500 mm	130ea	
	Micrometer	0 ~ 1500 mm	8ea	
	Height Gauge	0 ~ 600 mm	10ea	
	Wall Thickness Dial Gauge	0 ~ 150 mm	4ea	
	Wall Thickness Gauge (Digital)	0 ~ 200 mm	2ea	
NDE EQUIPMENT	RT Source	Ir-192	5ea	
	RT Source	Co-60	2ea	
	Ultrasonic Examination	-	2ea	
	Magnetic Particle Examination	Yoke	4ea	
	Magnetic Particle Examination	Probe	1ea	
	Liquid Penetrant Examination	Spray type	-	
HYDRO TEST	Hydro pressure tester	2000 Ton	2ea	
	Hydro pressure tester	1500 Ton	1ea	
	Hydro pressure tester	1000 Ton	1ea	

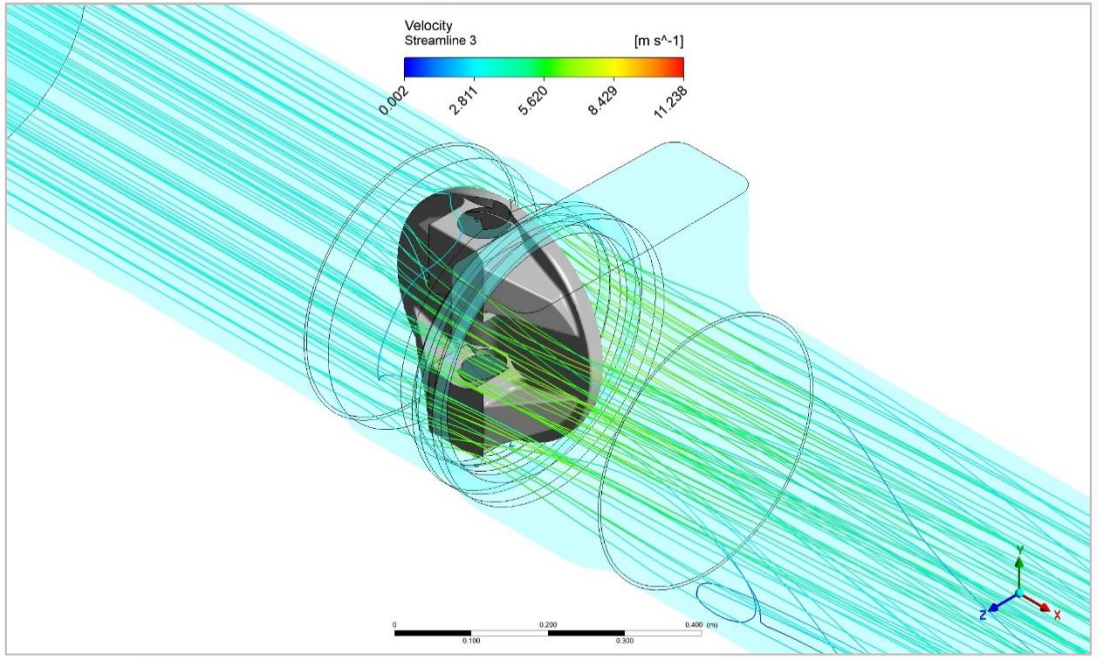
Capacity

3. Production Equipment

Division	Description	Range	Q'ty	Remark
HYDRO TEST	Hydro pressure tester	800 Ton	2ea	
HYDRO TEST	Hydro pressure tester	400 Ton	1ea	
HYDRO TEST	Hydro pressure tester	250 Ton	8ea	
HYDRO TEST	Hydro pressure tester	50 Ton	4ea	
High Pressure Gas Test	High pressure Gas pressure tester	Max. 700Bar	4ea	
CRYOGENIC TEST	Cryogenic testbed	-	13ea	
	Helium detector	-	2ea	
	Inspection monitoring system	-	3ea	
	Digital Flow Mete	-	13ea	

04

ENGINEERING

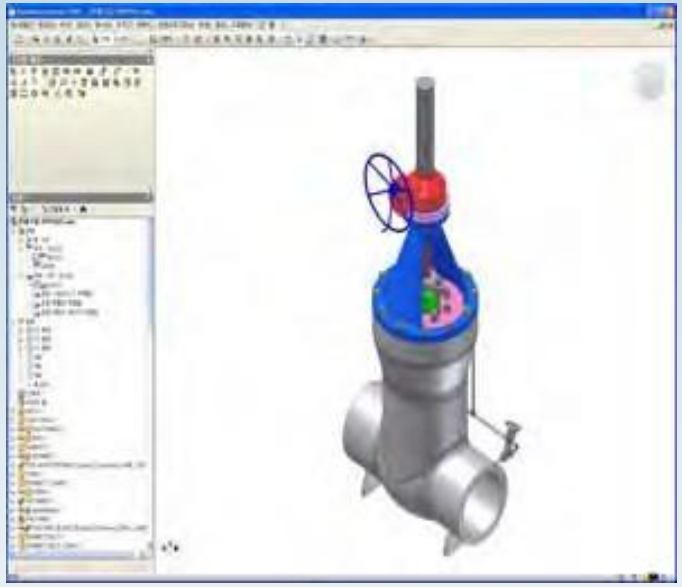


We are growing as a global leader in industrial valves

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Engineering

1. Performance



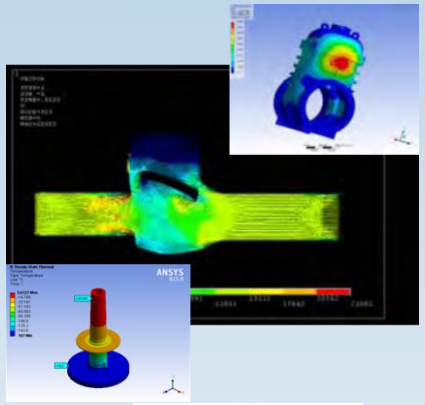
HOW TO DESIGN?

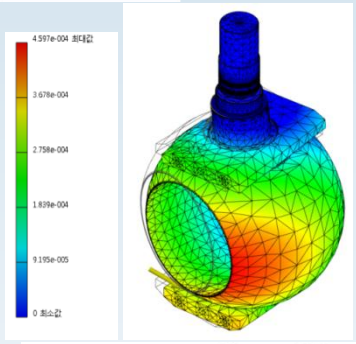
Almost 60 years of Design experience in critical applications in the nuclear, chemicals, oil & gas, etc.

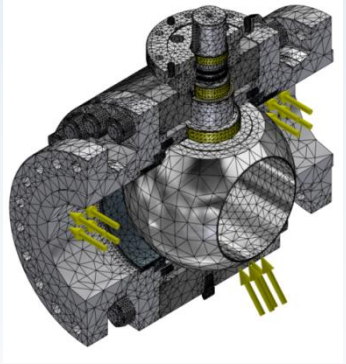
Customer’s requirement is a principle Design Input.
- Customer’s design specification
- Applicable code & standard(ASME, ASTM, AWS, et c.)
- Application of 3D CAD (Autodesk Inventor) System for design.
- Actuator selection data for motor operated valves

Engineering

1. Performance







HOW TO VERIFY THE DESIGN?

- Stress analysis
- Seismic qualification (ANSYS)
- Weak link analysis for MOV
(Motor Operated Valve)
- Flow analysis (ANSYS CFD)
- Environmental qualification
- Thermal Analysis for Cryogenic Valve
(ANSYS FEM)

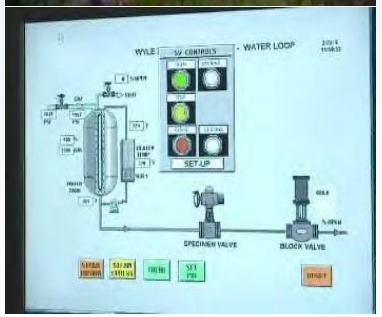
Engineering

1. Performance









HOW TO PERFORM THE QUALIFICATION TEST?

PK Valve & Engineering has own test facility for functional qualification.

- Pressure surge measurement
- Flow interruption & functional capability demonstration test
- End loading test
- Cold cycle test
- Flow coefficient measurement

Qualification tests for Motor Operated Valves have been performed at Wyle Laboratories, US

- Fundamental frequency test
- Seismic test
- Flow interruption & functional capability demonstration test
- Cold & hot cycle test
- End loading test

Engineering

2. Engineering

CAD System	AUTO CAD 2022 AUTODESK INVENTER SUITE 2022 PK Valves are designed by CAD system (AUTO CAD 2022) and AUTODESK INVENTER is exclusively used 3D drawing Drawings for NSSS (Nuclear Steam Supply System) are preparing by AUTODESK INVENTER
Analysis Program ANSYS 2022 R2	Design Analysis Capabilities with ANSYS program - Structural Analysis - Structural Nonlinearity - Material Model - Thermal Analysis - Flow Analysis - Interaction analysis (fluid-structure analysis) - Pre processing / Post processing - CFX for CFD (Computational Fluid Dynamic) analysis
WLA	Weak Link Analysis for Motor Operated Valves
Functional Qualification Test	The Functional Qualification Test for active valves has been performed in accordance with the requirements of ASME QME-1 at the Wyle Laboratory in the U.S.A

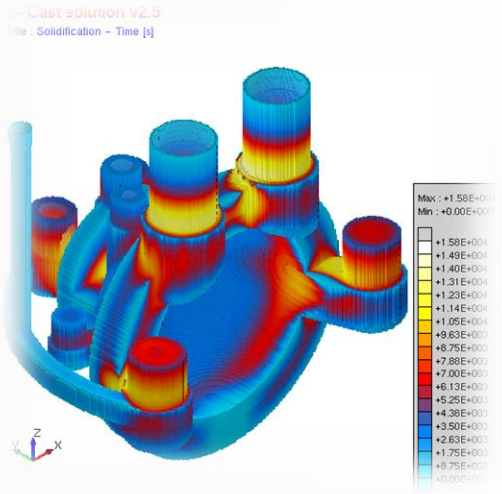
Engineering

3. NDE Personnel Qualification

No	Name	Cert' No.	Certification Method				Issue Date	Expiry Date	Remark
1	Kim, Yoon Jin	KTE-Q-LIII-0001	RT(III)	MT(III)	PT(III)	UT(III)	2021.03.10	2026.03.09	KTE
		185472	RT(III)	MT(III)	-	UT(III)	2020.07.13	2025.07.12	ASNT
2	Bae, Dae Jong	KTE-Q-LIII-0492	RT(III)	MT(III)	PT(III)	UT(III)	2022.08.12	2028.08.11	KTE
		98910/2	RI	-	-	-	2019.12.23	2024.12.26	TWI
3	Kim, Min Sik	KTE-Q-LIII-0493	RT(II)	MT(II)	PT(II)	UT(II)	2023.09.03	2026.09.02	KTE
4	Choi, Yong Jin	KTE-Q-LIII-0535	RT(II)	MT(II)	PT(II)	-	2024.01.21	2027.01.20	KTE
5	Nam, Hae Song	KTE-Q-LIII-0516	RT(II)	MT(II)	PT(II)	-	2024.01.21	2027.01.20	KTE
6	Seo, Young Il	KTE-Q-LIII-0500	RT(II)	MT(II)	PT(II)	-	2024.02.03	2027.02.02	KTE
7	Bang, Chang Hun	KTE-Q-LIII-0668	RT(II)	MT(II)	-	-	2023.01.01	2028.01.05	KTE
8	Kang, Woo Seok	KTE-Q-LIII-0472	RT(II)	MT(II)	PT(II)	UT(II)	2023.05.24	2026.05.23	KTE
9	Kim, Nam Hoon	KTE-Q-LIII-0101	RT(II)	MT(II)	PT(II)	UT(II)	2022.05.25	2027.05.24	KTE

Engineering

4. Casting Simulation



Z-CAST: Casting Process Simulation System

Pre Processing (Data Input)	a) 3D Modeling: AUTO CAD INVENTER SUITE 2009 b) Casting Design Modeling: AUTO CAD INVENTER SUITE 2009 c) CAD Data Interface: STL, IGES File d) CELL Cutting: MESH Creation
Analysis	a) Flow Analysis - Unsteady analysis considering incompressible viscous fluid and inertia force. - Using the continuity equation, equation of emotion and energy equation. - Using SOLA VOF Method b) Solidification Analysis - 3D unsteady thermal conductivity analysis and solidification analysis - Using finite-difference method (FDM) and temperature recovery method (Latent heat) - Utilization the result of flow analysis as basic factor for solidification an alysis
Post Processing (Data Output)	a) Saving as Movie (AVI) b) Filling time distribution, heat flow temperature distribution, speed vector, pressure distribution, checking the solidification fraction during flow c) Solidification time distribution, temperature distribution, criterion function d) Check shrinkage

05

CATALOGUE



We are growing as a global leader in industrial valves

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Head Office & Factory

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Tel_ +82-55-268-3777
Fax_ +82-55-286-0281

Seoul Sales Office

Address_ 1318, Myeongdong MFirst Place, 15-1, Samil-daero 8-gil, Jung-gu, Seoul
Tel_ +82-55-260-5795 / 5796





Korea's First and Largest Industrial Valve Specialized Manufacturer, PK Valve & Engineering Co.,Ltd.

Beginning

1980
Renamed to Pan-Korea Metal Ind.

1974
Moved to Changwon Industrial Complex

1946
Established Busan Pokum Jnd

Challenge

1994
Established R&BD Center

1988
Registered as selected localization company of Cryogenic Valve at KOGAS

1985
Developed Cryogenic Valve

Growth

2006
NEP Certification for Cryogenic Metal Seated Butterfly Valve
Changed company name to PK Valve

2002
Developed Cryogenic Butterfly Valve
Cryogenic valve supply started to KOGAS

2000
1st Valve Academy launched

Leap

2022
Changed company name to PK Valve & Engineering

2021
Expansion of cryogenic valve factory

2017
Cryogenic Butterfly valves supply started to LNGC

2012
Awarded 100 Million Dollar Export Tower

About Us



Digitalization

PK VALVE&ENGINEERING has already achieved digitalization of data on orders, production process, and quality control for the past 20 years through the establishment of an ERP system, and now PK VALVE&ENGINEERING is preparing to digitize the development process and results. By accumulating data on the development process, we will dramatically reduce trial and error and provide solutions that satisfy customers within a short delivery

Demonstration

PK VALVE&ENGINEERING is starting a performance verification demonstration business for products that are not regulated by codes and standards. By applying data sensing technology and data collection technology to design and manufacture new products, we are accumulating technologies that can accurately reflect customer requirements by implementing actual use environments.

Diversification

PKVALVE & ENGINEERING is striving to diversify its products by developing various products that can be used in extreme conditions such as ultra-low temperature, ultra-high temperature, ultra-large size, and ultra-high pressure through digitalization and demonstration.

Certificates

SHEQ & Product


API Q1&Q2


API Q1&Q2


CE PED


SIL Level 2


TR-CU


ISO 9001


ISO 14001


ISO 45001

Nuclear


KEPIC MN


ASME N


ASME NPT

Marine Classification


DNV-GL


LR


KR


BV


ABS


NK


CCS

Refinery

Long experience and proven references in large scale projects

PK VALE & ENGINEERING has a track record of participating in large-scale oil refinery projects for decades.
We have the capability to manufacture and test a large number of valves in a timely manner and the capability to manage projects, thereby supporting the successful project execution of our customers. In addition to our capacity and capability to produce the world's largest 92-inch cast steel gate valve, we have developed and manufactured all types of valves used in extreme conditions, such as high-temperature/pressure and cryogenic applications.



[제목 없음]



Production Capability

We maintain an integrated production system that allows us to control all processes from A to Z in our own facility, Engineering, Foundry, Machining, Assembly, Test/inspection, Paining and Package. It is designed and manufactured to meet and go beyond customer needs and expectation, and supplied after thorough verification test through demonstration under conditions similar to the operating environment.

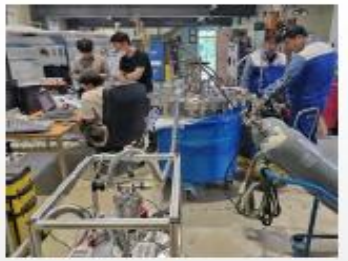
We are able to offer an optimized solutions for our customers by reflecting accumulated know-how and experiences at site in resolving issues and challenges with customers.
In case repair and maintenance is required, VALVE MEDIC TEAM is available 24/7 upon request.



Integrated production system



Workers are pouring molten metal in our factory to make casting material.



R&D CENTER staff are conducting a valve leakage test under -253 degrees Celsius.



The VALVE MEDIC TEAM (valve maintenance organization) is repairing the MOTER OPERATED VALVE.

Power



Key supplier in Nuclear Steam Supply System and Balance of Plant In Nuclear Power Plant

PK Valve & Engineering has been playing a vital role as a reliable supplier for the Nuclear Steam Supply System (NSSS) and Balance of Plant (BOP) in nuclear power plants as well as cogeneration and combined cycle power plants.
In 1988, through the development of valves for nuclear power, PK started to supply to the Korea's nuclear power plant by participating in Yeonggwang Units 3 and 4, and followed by Uljin Nuclear Power Plant, Kori Nuclear Power Plant, Shin-Kori Nuclear Power Plant, Shin-Wolseong Nuclear Power Plant, Shin-Gori Units 5 and 6 Nuclear Power Plant.
The Barakah Nuclear Power Plant in UAE was the first nuclear power plant in overseas and is expected to export to global nuclear markets.

Valve development and quality control system

We operate a system to supply valves that is required for a high level of design and quality control, such as products in main and auxiliary equipment of nuclear power plants.
In particular, we are working on design improvement by utilizing our experience accumulated for a long period of time.
The computer simulation technology can contribute to improving quality of high temperature/pressure valves installed in pipes for cogeneration and combined cycle power plants.



Prototype (16 inch-1680#) manufacturing for QME-1 Test in Nuclear Power Plant

Capability to design and manufacture valves capable of controlling high-temperature, high-pressure differentials

CBD Valves (Continuous Blowdown Valve) :

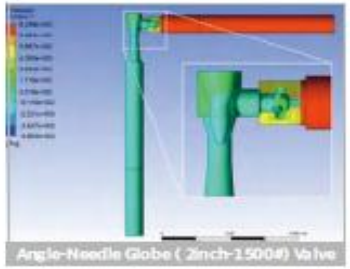
Continuous blowdown valves are used in power plants to continuously remove a small amount of boiler water to control the concentration of impurities within the boiler. These impurities, such as dissolved solids and minerals, tend to concentrate in the boiler water when steam is produced. If not removed, various problems such as scale build-up, corrosion and reduced boiler efficiency can occur.

IBD Valves (Intermittent Blowdown Valve) :

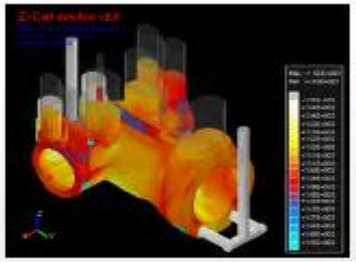
Unlike continuous blowdown, intermittent blowdown discharges a larger volume of boiler water at fewer intervals. Intermittent blowdowns are usually performed during periods of low boiler demand or when certain conditions are met, such as predetermined time intervals or a certain water level in the boiler.

Since CBD/IBD Valves are a high-temperature, high-pressure, and corrosive environment, it requires extremely high durability and ease of maintenance compared to common valves.
PKVALVE & ENGINEERING has the capability to design and manufacture valves that can be used in these harsh environments.

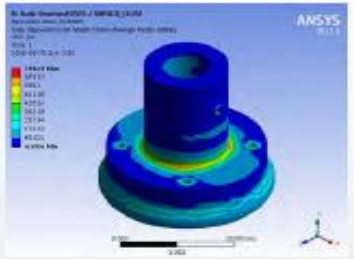




Angle-Needle Globe (2inch-1500#) Valve



Computer solidification analysis to check the soundness of the casting before mass production



Computer structural analysis to examine whether structural stability can be secured even under high temperature and high pressure conditions



QME-1 TEST for Motor Operated Valve in Nuclear Power Plant

Chemical

Supply of specialized products to chemical plants through experience in participating in chemical projects

PKVALE & ENGINEERING has a track record of participating in large-scale chemical plant construction projects for decades.
LFE Packing is also used for general chemical process valves to solve the leakage problem from valves, and we have design and quality control capabilities to ensure low leakage performance.
In particular, we have numerous supply records as well as design and manufacturing capabilities to supply Bellows valves in cases where leakage is extremely limited.



Photo of finished product cladding
inside of GATE VALVE (20inch-2500#)

Price Competitiveness with cladding technology

In case of valve required for severe corrosion resistance, there is no choice but to use solid corrosion-resistant materials such as Monel and Inconel which are very expensive.
In case of valves, unlike pipes, it is difficult to apply cladding because of complicated its shape and structure.
However, PK VALVE & ENGINEERING has developed cladding technology at our own that can be applied with the patented welding technology cost-efficient cladding process.
In case of 6" and larger, cladding is recommended, but for 4" or smaller, cladding is not an option due to price advantage and accessibility for cladding.





Photo of cladding inside
the bonnet of the 20inch-2500# GATE VALVE



Photo of cladding inside
the body of the 20inch-2500# GATE VALVE

Bellows valve – the best choice for leak prevention

If valve leakage is becoming a problem due to the increase in the use of various chemicals harmful to the human body, our bellows valve is the best choice to solve this challenge. "Take safety and efficiency to the next level with our bellows valves." Our bellows valves are designed to fit into modern plant operating environments, ensuring safe operation while minimizing leakage problems.

This provides the following benefits:

Leak-proof technology: Advanced bellows technology makes the valve virtually leak-free and greatly reduces the chance of hazardous substances leaking.
Environmentally friendly: Supports the use of new fuels such as ammonia and methanol to create an environmentally friendly production environment.
Durability and reliability: Bellows valves made with specially strengthened materials and precision manufacturing techniques ensure long life and excellent performance.
Adaptability and versatility: Available in a variety of specifications and sizes, applicable to a wide variety of chemical production plants. Get rid of leakage problems and meet bellows valves for safe and efficient production. We are always ready to be with you for your successful production.



Customers Care

Global Network

● Head Office ● Authorized Distributors ● After-Sales Representatives



SOUTH KOREA
- BUMHAN VALVE CO., LTD
- DAESUNG TMS
- PK VALVE PLUS
- DAESUNG PIPING
- HOAM CO., LTD

SOUTH EAST ASIA
- PT. VALVE AUTOMATION INDONESIA
- S.A. PETROTECH CO., LTD

AMERICA
- MENGER VALVE(USA)
- ALEXANDER VALVE & SUPPLY (CANADA)

EUROPE & AFRICA
- G.G.C VALVES(UK)
- TNB GLOBAL

Valve Medic

After consultation with the customers, our engineers visit the customers and provide customized training and consulting to solve the problems faced by the customers. We respond to customer problems together, such as valve troubleshooting, maintenance method training, valve specification review.



AEO

On April 30, 2023, AEO certification (KR AEO 3123007) was obtained from the Korea Customs Service. AEO certification is a system that certifies export safety management companies that meet the international standards of the World Customs Organization for trade safety and facilitation.

Training & Education

Engineer Training

Training Service for Engineers came from Middle East Fuji LLC.







Training Service for Engineers came from Marine Systems & Solutions







Valve Academy

PK VALVE&ENGINEERING is the only valve manufacture in the world that has been running the "Valve Academy" program since 2000 to strengthen communication with customers. It was first held free courses for valve agency employees in terms of valve job training, and it was opened to general customers in 2005 at the request of major customers. In 2023, the "18th Valve Academy" was held to expand communication with customers.





Positioning as the Global Brand in the next energy industry

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Reference

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Reference

1. Reference List

Project	Customer	Location	Delivey
LAKE CHARLES POWER STATION UNIT1, USA	ENTERGY CORPORATION	U.S.A	2018
ST. CHARLES POWER STATION UNIT1, USA	ENTERGY CORPORATION	U.S.A	2017
MASINLOC POWER PLANT EXPANSION PROJECT	AES-VCM Mong Duong Power Co. Ltd	KOREA	2025
MASINLOC POWER PLANT EXPANSION PROJECT	AES-VCM Mong Duong Power Co. Ltd	PHILIPPINES	2017
JAZAN INTERGRATED GASIFICATION COMBINED CYCLE	Aramco Overseas Comp	ENGLAND	2016
JAZAN INTERGRATED GASIFICATION COMBINED CYCLE	Aramco Overseas Comp	IRELAND	2017
JAZAN INTERGRATED GASIFICATION COMBINED CYCLE	Aramco Overseas Comp	SAUDI ARABIA	2022
Banwol Power Plant Main Steam Valve	Banwoul COGENERATION CO., LTD	KOREA	2019
NNEG HRSG	BHI Co., LTD.	KOREA	2022
NNEG HRSG	BHI Co., LTD.	SAUDI ARABIA	2015
S-OIL Waste Heat Power Plant	CHEIL INDUSTRIES INC.	KOREA	2022
Matarbari Ultra Super Critical Coal-Fired Power Pr	Coal Power Generation Company Bangladesh Limited	BANGLADESH	2015
TPC 800MWx3 Lin Kou Power Plant EPC project	CTCI CORP.	TAIWAN	2017
Tung Hsiao HRSG PROJECT	CTCI CORP.	TAIWAN	2018

Reference

1. Reference List

Project	Customer	Location	Delivery
Banwol Power Plant Main Steam Valve	Daesung piping Co.,Ltd	KOREA	2018
Shin Pyeongtack 3CCPP	Daesung T.M.S	KOREA	2016
Fast Track 3A Malaysia 1x1000MW Coal Fired Power P	DL E&C CO., LTD	MALAYSIA	2018
SONGDO COMBINED HEAT & POWER PLANT	DL E&C CO., LTD	KOREA	2016
VIETNAM Thai Binh 2 Thermal Power Plant	DL E&C CO., LTD	VIETNAM	2016
1 x 660 MW CIREBON COAL FIRED POWER PLANT	Doosan Heavy Industries & Construction Co., Ltd.	INDONESIA	2018
Botswana Power Project	Doosan Heavy Industries & Construction Co., Ltd.	BOTSWANA	2020
Goseong Power Plant Project.	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2018
Grati Block 2, CCPP Plant 500MW	Doosan Heavy Industries & Construction Co., Ltd.	INDONESIA	2018
GT MANUAL VALVE FOR SEOUL CHPP	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2022
HSDT2 CHP PLANT PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2022
JAWA #9,10 THERMAL POWER PLANT PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	INDONESIA	2018
Karabatan Power Plant Project.	Doosan Heavy Industries & Construction Co., Ltd.	KAZAKHSTAN	2023
Nghi Son2 Thermal Power Plant	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2021
Nghi Son2 Thermal Power Plant	Doosan Heavy Industries & Construction Co., Ltd.	VIETNAM	2015

Reference

1. Reference List

Project	Customer	Location	Delivery
Nuclear Power Plant of SHU #1,2 PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2025
OSeong CCPP HRSG 800MW * 3UNIT	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2022
Palu-3 CFB Power Plant (55MW x2)	Doosan Heavy Industries & Construction Co., Ltd.	INDONESIA	2022
SAMCHEOK THERMAL POWER PLANT UNITS 1 & 2 (1,050MW	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2021
Shin-Kori Nuclear Power Plant Unit 5, 6 FTT VALVE	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2022
ShinSeocheon Thermal Power Plant Project	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2021
Sodegaura Biomass Power Plant	Doosan Heavy Industries & Construction Co., Ltd.	JAPAN	2017
SONGHAU POWER PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2025
SONGHAU POWER PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	VIETNAM	2023
TAEAN IGCC PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2015
TAEAN IGCC PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	LIBYA	2015
TOUR HRSG PJT 400MW * 1UNIT	Doosan Heavy Industries & Construction Co., Ltd.	SAUDI ARABIA	2021
VT4 POWER PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	VIETNAM	2019
VT4 POWER PROJECT - Expansion manual	Doosan Heavy Industries & Construction Co., Ltd.	VIETNAM	2025
Wolsung Nuclear Power Plant Unit 5,6	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2024

Reference

1. Reference List

Project	Customer	Location	Delivery
Yanbu 2 POWER AND WATER PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	KOREA	2021
Yanbu 2 POWER AND WATER PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	QATAR	2022
Yanbu 2 POWER AND WATER PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	SAUDI ARABIA	2016
Yanbu 3 POWER AND WATER PROJECT	Doosan Heavy Industries & Construction Co., Ltd.	SAUDI ARABIA	2019
103MW X 2 CEBU COAL FIRED POWER PLANT	DUCKWON TRADING CO.,LTD.	KOREA	2025
Cebu Power Plant	DUCKWON TRADING CO.,LTD.	PHILIPPINES	2023
EGCO Cogen Re-Powering Project	EGCO Generation Co., Ltd.	JAPAN	2022
RAZ AZ ZAWR CCPP HRSG 2400MW, 10 units	FICHTNER	KOREA	2024
RAZ AZ ZAWR CCPP HRSG 2400MW, 10 units	FICHTNER	SAUDI ARABIA	2024
Calcasieu II HRSG Duct Burner Observation Port	GE GAS	U.S.A	2023
Kindle Magnolia HRSG Duct Burner Observation Port	GE GAS	U.S.A	2023
Plaquemines HRSG Duct Burner Observation Port	GE GAS	U.S.A	2024
TVA CUMBERLAND HRSG Duct Burner Observation Port	GE GAS	U.S.A	2025
TVA KINGSTON HRSG Duct Burner Observation Port	GE GAS	U.S.A	2017
240 MW CCPP JEJU	GE POWER SYSTEMS KOREA	KOREA	2017

Reference

1. Reference List

Project	Customer	Location	Delivery
DUBA 1 HRSG PROJECT	GE POWER SYSTEMS KOREA	SAUDI ARABIA	2021
Fadhili Combined Heat and Power Project	GE POWER SYSTEMS KOREA	SAUDI ARABIA	2016
GHORASAL HRSG PROJECT	GE POWER SYSTEMS KOREA	BANGLADESH	2018
KOUDIET HRSG MANUAL	GE POWER SYSTEMS KOREA	TURKEY	2020
Dangjin Biomass 2 Power Plant	GS E&C	KOREA	2015
SOHAR2&BARKA3 (HRSG) 750MW * 4 UNIT	GS E&C	OMAN	2017
Anyang Combined Heat & Power Plant Project	GS POWER	KOREA	2022
Anyang Combined Heat & Power Plant Project#2	GS POWER	KOREA	2019
Donghae Bukpyeong Power Plant Facility Improvement Project	GS POWER	ETC.	2016
2017 Year Power Team 216 Steam Header Line Valve C	GS-CALTEX Corporation	KOREA	2018
2018 Year Power Team NO.3 WHB Soundness TEST For V	GS-CALTEX Corporation	KOREA	2016
Power Team No.2 PKG Boiler Operate Purpose S/D Val	GS-CALTEX Corporation	KOREA	2023
144MW HANJU CCPP	HANWHA E&C	KOREA	2019
Daesan Fuel-Cell Power Plant	HANWHA E&C	KOREA	2024

Reference

1. Reference List

Project	Customer	Location	Delivery
TONGYEONG Combined Cycle Power Plant	HANWHA E&C	KOREA	2023
TONGYEONG ECO POWER BOILER	HANWHA E&C	KOREA	2022
Yanbu 2 POWER AND WATER PROJECT	HANWHA E&C	SAUDI ARABIA	2025
FFBL COAL POWER PLANT(CPP) PROJECT- CFB BOILERS	HD Korea Shipbuilding & Offshore Engineering Co.,Ltd.	KOREA	2016
FFBL COAL POWER PLANT(CPP) PROJECT- CFB BOILERS	HD Korea Shipbuilding & Offshore Engineering Co.,Ltd.	PAKISTAN	2024
JEDDAH SOUTH THERMAL POWER PLANT STAGE-I	HD Korea Shipbuilding & Offshore Engineering Co.,Ltd.	KOREA	2019
JEDDAH SOUTH THERMAL POWER PLANT STAGE-I	HD Korea Shipbuilding & Offshore Engineering Co.,Ltd.	KUWAIT	2025
JEDDAH SOUTH THERMAL POWER PLANT STAGE-I	HD Korea Shipbuilding & Offshore Engineering Co.,Ltd.	SAUDI ARABIA	2023
SHUQAIQ STEAM POWER PLANT	HD Korea Shipbuilding & Offshore Engineering Co.,Ltd.	KOREA	2025
SHUQAIQ STEAM POWER PLANT	HD Korea Shipbuilding & Offshore Engineering Co.,Ltd.	SAUDI ARABIA	2016
Oseong CCPP	HJ Shipbuilding & Construction Co., Ltd	KOREA	2019
Shin Seocheon Thermal Power Plant	HJ Shipbuilding & Construction Co., Ltd	KOREA	2024
Algeria Oumache 1,300MW CCPP	Hyundai E&C Co., Ltd.	ALGERIA	2017
BISKARA&JIJEL HRSG PROJECT	Hyundai E&C Co., Ltd.	ALGERIA	2016
DUBA GREEN INTEGRATED SOLAR COMBINED CYCLE POWER P	INITEC ENERGIA	SAUDI ARABIA	2015

Reference

1. Reference List

Project	Customer	Location	Delivery
THAI BINH THERMAL POWER PLANT 2 x 300MW FLUE GAS T	KAWASAKI HEAVY INDUS	VIETNAM	2015
Shin-Ulchin Nuclear Power Plants Unit 1,2 P206D	KEPCO	KOREA	2022
Shin-Ulchin Nuclear Power Plants Unit 1,2 P209	KEPCO	KOREA	2016
Wolsung Nuclear Power Plant Unit 1	KEPCO	KOREA	2025
BNPP(BRAKA Nuclear Power Plant Project)	Kepco-enc	ARAB EMIRATES	2024
Nuclear Power Plant of BNPP #1,4	Kepco-enc	ARAB EMIRATES	2017
Hanbit Nuclear Power Plant Unit5,6	Korea Hydro & Nuclear Power Co. Ltd.	KOREA	2019
PK Nuclear Power Plant Unit 4	Korea Hydro & Nuclear Power Co. Ltd.	KOREA	2018
Shin-Kori 5&6 Nuclear Power Plants/P204	Korea Hydro & Nuclear Power Co. Ltd. in GORI	GERMANY	2025
Shin-Kori 5&6 Nuclear Power Plants/P204	Korea Hydro & Nuclear Power Co. Ltd. in GORI	KOREA	2024
Shin-Kori 5&6 Nuclear Power Plants/P209	Korea Hydro & Nuclear Power Co. Ltd. in GORI	KOREA	2016
Singori Nuclear Power # 1,2 P204A	Korea Hydro & Nuclear Power Co. Ltd. in GORI	KOREA	2024
Taean Thermal Power Plant Maintenance Materials	Korea Western Power Co. Ltd	KOREA	2022
Naepo new city combined heat and Power Plant const	Lotte Engineering & Construction Co., Ltd.	KOREA	2018
SABALAN Combine Cycle Power Plant	MAPNA GROUP	IRAN	2019

Reference

1. Reference List

Project	Customer	Location	Delivery
LUMUT BALAI GEOTHERMAL POWER PLANT	MAPROS CORPORATION	INDONESIA	2025
IGCC FNK/FHN	MITSUBISHI HEAVY IND	JAPAN	2025
Katatsumuri Yama Power Plant SAGS	Nippon Steel Pipeline Engineering Co., Ltd. (NSPE)	JAPAN	2024
BRUCE POWER	PETROCANADA	CANADA	2024
Eumseong Natural Gas Power Plant 1unit	POSCO CONSTRUCTION	KOREA	2023
Panama Gatun CCPP (640MW)	POSCO CONSTRUCTION	KOREA	2023
Panama Gatun CCPP (640MW)	POSCO CONSTRUCTION	PANAMA	2021
POSCO POHANG NEW BY-PRODUCT GAS CCPP	POSCO CONSTRUCTION	KOREA	2022
Salak Brine Heat Recovery Binary Power Plant	PT.TRIPATRA ENGINEERS AND CONSTRUCTORS	INDONESIA	2025
Gangneung Thermal Power Plant	SAMSUNG C&T	KOREA	2018
Thai PTT LNG In Plant Power Generation	SAMSUNG ENGINEERING CO.,LTD.	THAILAND	2017
Fadhili Combined Heat and Power Project	SEENTEC CO.,LTD.	SAUDI ARABIA	2021
103MW X 2 CEBU COAL FIRED POWER PLANT	SEOCHANG INDUSTRY CO., LTD	KOREA	2019
103MW X 2 CEBU COAL FIRED POWER PLANT	SEOCHANG INDUSTRY CO., LTD	PHILIPPINES	2019
Pocheon LNG Power Plant	SEOCHANG INDUSTRY CO., LTD	KOREA	2024

Reference

1. Reference List

Project	Customer	Location	Delivery
SHINSEJONG COMBINED CYCLE POWER PLANT PROJECT	SEOCHANG INDUSTRY CO., LTD	KOREA	2021
JIGCC Power Block Project(Package 4)	SEPCO Electric Power Construction Corporation	SAUDI ARABIA	2025
Gezer/Haifa Combined Cycle Power Plant	SIEMENS	ISRAEL	2023
Gezer/Haifa Combined Cycle Power Plant	SIEMENS	KOREA	2018
Gezer/Haifa Combined Cycle Power Plant	SIEMENS	TURKEY	2023
Eco-friendly gas engine power generation project	SK ecoengineering	KOREA	2019
GOSEONG HAI POWER PLANT #1 & 2	SK ecoengineering	KOREA	2016
HANAM Combined Heat & Power Plant	SK ecoengineering	KOREA	2016
Jangmoon Combine Cycle Power Plant	SK ecoengineering	KOREA	2017
PACO Power plant	SK ecoengineering	PANAMA	2024
Seosan Plant 3's own power generation	SK ecoengineering	KOREA	2024
SKMU CHP Project (300MW X1)	SK ecoengineering	KOREA	2025
ULSAN GPS CCPP PROJECT	SK ecoengineering	KOREA	2022
Yeoju Combine Cycle Power Plant	SK ecoengineering	KOREA	2018
JIGCC Utilities - Common Area - Package 5	TECNICAS REUNIDAS,S.A	SAUDI ARABIA	2018

Reference

1. Reference List

Project	Customer	Location	Delivery
Lontar Extension Coal Fired Steam Power Plant	TOSHIBA CORPORATION	INDONESIA	2024
Van Phong 1 BOT Thermal Power Plant Project	TOSHIBA CORPORATION	VIETNAM	2025
XPTA1 20MW Tanawon Geothermal Power Plant	TOSHIBA CORPORATION	PHILIPPINES	2025
CONVERSION OF RIYADH PP# 10 COMBINED CYCLE POWER P	UNITED PIPING SOLUTIONS DMCC	SAUDI ARABIA	2017
PP13 Combined cycle power plant project	UNITED PIPING SOLUTIONS DMCC	SAUDI ARABIA	2018
QATALUM COMBINED CYCLE POWER PJT (HRSG)	VALVETECH	KOREA	2023
ERZIN HRSG MOV	VPS	KOREA	2024
ERZIN HRSG MOV	VPS	TURKEY	2022
QATALUM COMBINED CYCLE POWER PJT (HRSG)	VPS	QATAR	2025
QATALUM COMBINED CYCLE POWER PJT (HRSG)	VPS	SAUDI ARABIA	2017
Sugar power plant expansion	WORLD SOURCE FLOW CONTROL CO.,LTD	THAILAND	2024







Positioning as the Global Brand in the next energy industry

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Management System Manual

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MANAGEMENT SYSTEM MANUAL

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80, GONGDAN-RO, SEONGSAN-GU, CHANGWON-SI, KOREA
ZIP CODE: 51567, TEL: 055-268-3781, FAX: 055-286-2112
HOMEPAGE: http://www.pkvne.com

I. Company Introduction

Since its establishment in 1946, PK Valve & Engineering Co., Ltd. is a Korean leading valve manufacturing company producing and supplying various kinds of steel valves including carbon steel, stainless steel, low-alloy steel, and high special alloy steel valves for petrochemical industry, chemical industry, oil & gas industry, power plant, or nuclear power plant.

PK V&E has been producing quality valves of large range that meet the requirements of both domestic and foreign customers on the basis of advanced technologies, wide experiences, and skilled personnel, and makes every efforts to supply best-quality valve products with the highest competitive price and delivery by constructing a consistent work system for design, pattern manufacturing, melting, casting process, fabrication process, and testing and inspection.

2) History

- 1946: Established Busan Pokum Ind. Company in Busan, Korea
- 1968: Changed to Busan Pokum Ind. Co., Ltd.
- 1971: Obtained KS (Korean Industrial Standard) manufacturing license certification for Bronze & Cast Iron Valves
- 1975: Removed all facilities and factory to Chang-won Industrial Complex
  Obtained KS manufacturing license certification for Cast Steel & Marine Valves
- 1978: Approved API 6D Pipe Line Valves (Gate, Check, Ball, Plug) Manufacturer by API
  Approved Carbon Steel & Stainless Steel Castings Manufacturer by KR
- 1980: Renamed to Pan-Korea Metal Ind. Co., Ltd.
  Approved Steel Casting Manufacturer by Lloyd's
- 1981: Obtained Manufacturing License for Nuclear Power Plant Valves
  Approved Steel Casting Manufacturer by Nippon Kaiji Kyokai
- 1983: Approved Steel Casting Manufacturer by DNV
- 1985: Developed Cryogenic Valves
- 1986: Obtained Patent of Manufacturer for Emergency Shutoff Ball Valve
  Approved Steel Castings Manufacturer by BV
- 1987: Developed Pressure Steel Type Valves for high pressure and high temperature
- 1993: Obtained ISO 9001 certificate for quality system by BVQI
- 1996: Developed Bellows Seal Gate & Globe, Metal Seat Ball, Wafer Tilting Check valves
- 1997: Obtained KEPIC certificate for mechanical nuclear engineering (MN)
- 1999: Developed Low Emission Packing for valve and Super Duplex Stainless Steel
- 2000: Developed Triple Offset Butterfly valve
- 2001: Obtained CE certificate for PED/97/23/EC by SGS UK
- 2005: Obtained API Monogram certificate for API Std. 600 Bolted Bonnet Gate Valve
- 2005: Obtained ISO 14001 & OHSAS 18001 certificate by BVQI
- 2006: Renamed to PK Valve Co., Ltd.
- 2007 :Changed Notify Body(NB) for CE certificate (SGS UK → BV Internationally Certified)
- 2009: Obtained N, NPT Certificate of Authorization by ASME
- 2011 : Material R&D Center
  Shipment of 88 inch Gate valve which is the biggest in the world
- 2014 : Obtained SIL Certificate
  Obtained TR-CU Certificate
- 2015 : Shipment of 92 inch Gate valve which is the biggest in the world
- 2016 : Obtained ABS Certificate
- 2020 : ISO 45001:2018 Certificate by B.V
- 2022 : PK Valve & Engineering Co., Ltd. Company Name Change
- 2023 : Obtained UK Certificate
- 2023 : Obtained API 609 Certificate

PK Valve & Engineering Controls the flow
MSM–100 REV. 52
The leading company in the Valves

3) Certifications

NO.	Certification Body	Scope of Certification	Remarks
1	BV Internationally Certified	Design/Development, Production and Servicing of Gate, Globe, Check, Ball, Plug & Butterfly Valve and Steel Casting	ISO 9001: 2015 ISO 14001: 2015 ISO 45001 : 2018
2	American Petroleum Institute	API 6D, API 600 & API 609 Monogram	
3	Korea Register of Shipping	Carbon and Stainless Steel Castings	
4	Lloyd's Register of Shipping	Steel Casting : Carbon and Carbon-manganese, Austenitic stainless	
5	Nippon Kaiji Kyokai	Carbon Steel Castings	
6	DNV	Steel Castings : Carbon and Carbon-manganese, Austenitic stainless	
7	Bureau Veritas	Steel Castings in Carbon steel, Alloy steel, Austenitic stainless steel, Duplex steel and Al-Bronze steel	
8	Korea Electric Association	- Construction of Class 1, 2, 3 line Valve - Fabrication of Class 1, 2, 3 parts & appurtenance - Material organization manufacturing casting and supplying ferrous, non-ferrous and welding material related to above items	KEPIC-MN
9	BV Internationally Certified	Casting Gate, Globe, Swing check, Tilting check, Lift check, Ball, Butterfly Valve & Forged Ball Valve	PED 2014/68/EU
10	ASME (American Society of Mechanical Engineers)	Construction of Class 1, 2 & 3 valves.	ASME N
		Class 1, 2 & 3 fabrication without design responsibility and fabrication with design responsibility for Class 1, 2 & 3 appurtenances and as a Material Organization manufacturing and supplying ferrous & nonferrous material.	ASME NPT
11	SGS-TUV	Gate, Globe, Butterfly, Ball Valve	SIL Level II
12	Russian Certification Institute	Gate, Globe, Check, Butterfly, Ball Valve	TR-CU
13	American Bureau of Shipping	Steel Casting : Carbon, Low Alloy and Stainless steel	
14	UK	General & Cryogenic Gate, Globe, Swing(Tilting, Lift) Check, Butterfly& Ball Valve	

II. SHEQ Management Policy

On the basis of "Base on Reliability" as a fundamental management philosophy, all employees at PK Valve & Engineering Co., Ltd. ("PK V&E") respect human life and worker's health care before all production activities, provide satisfactory products and services that meet the requirements of customers by means of management activities in harmony with environment and continuing technological development and quality innovations, and further make every efforts to fulfill our social responsibilities and obligations with the realization of human happiness as our top priority, including the policies specified below.

- Effective operation of Quality & SHE (Safety, Health, and Environment) management system and complying with regulatory.
- Customer satisfaction and enhance competitiveness.
- Continual improvement to minimize environment effects.
- Participation of workers and preventing potential accidents through proactive hazard control.

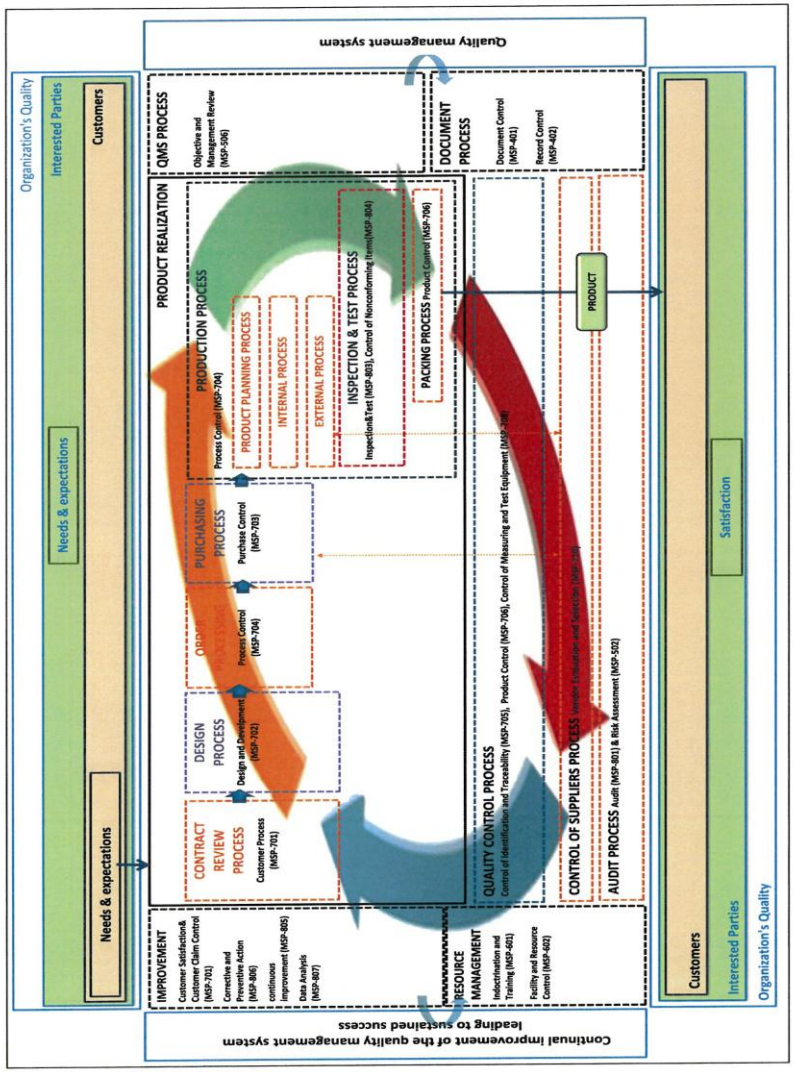
PK Valve & Engineering Co., Ltd. recognizes that all employees can create prosperous future in harmony with environment, customer satisfaction, and industrial accidents through knowledge management for quality & safety, health and environment. It is imperative that we all take proactive actions to achieve the highest level of knowledge management.

PK Valve & Engineering Co., Ltd.

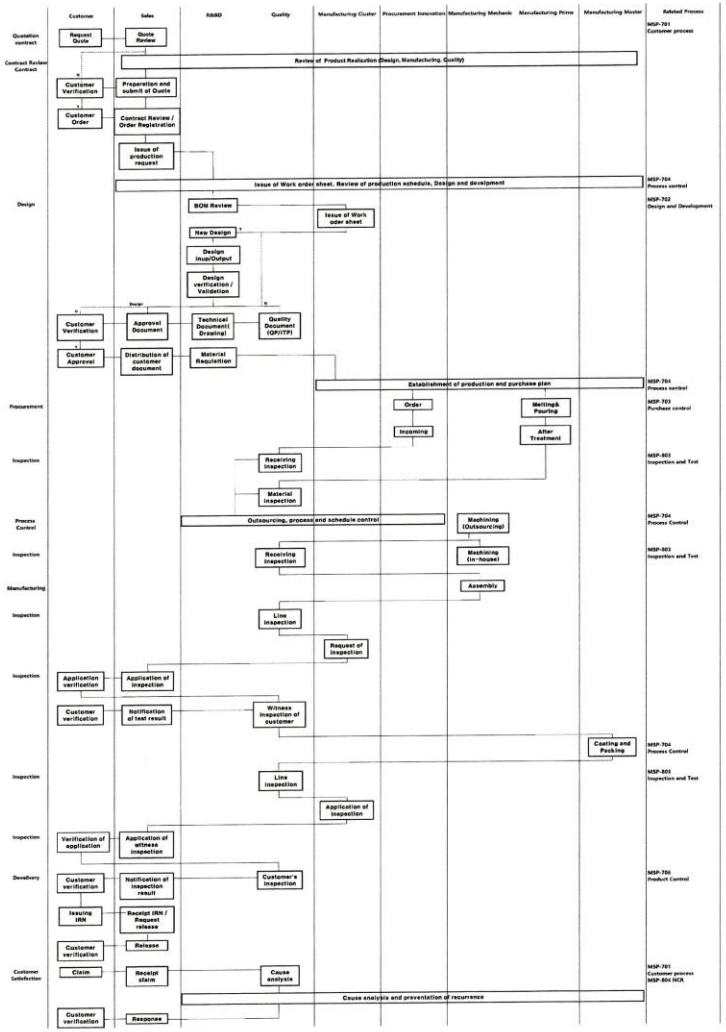
CEO Seong Jin, Byun

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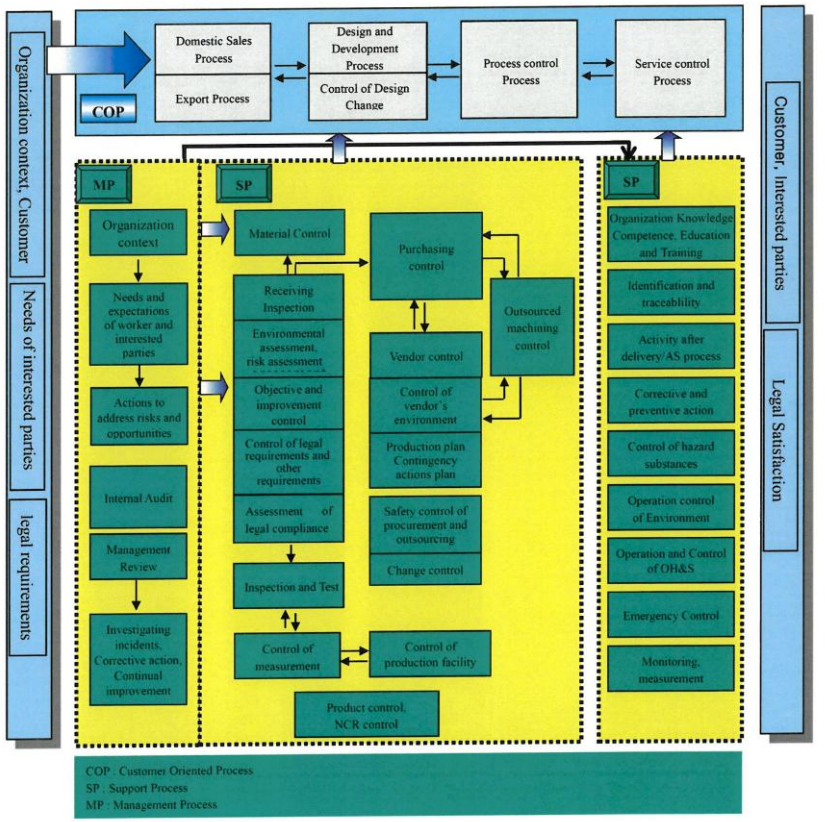
III. Management System Chart



III. Management System Chart : Product Realization Process



III. Management System Chart (Environment, Safety&Health)



IV. Revision Status

Revision date	Revision No.	Revision contents	Remark
2018.07.23	42	This manual was overall revised according to ISO 9001 : 2015, ISO 14001 : 2015	
2019.05.08	43	Change of organization : Outsourcing Team is added	
2019.11.27	44	Missed code requirements (API Q1) are added. And related procedures are identified.	
2020.02.03	45	Change of organization : Production Technology Team is added	
2020.06.15	46	This manual was overall revised according to ISO 45001 : 2018	
2022.03.31	47	Change of Organization and Management System Chart	
2022.06.17	48	Change of Company Name and Reorganization	
2022.07.20	49	Added PE(S)R 2016	
2023.04.17	50	Change of organization Development Division General Director and Manufacturing Innovation Div → Business Div QC Team is deleted.	
2024.08.12	51	Reflection of API Q1 10 edition Change of organization : Procurement Innovation Team changed from Management Planning Division to Business Division.	
2026.04.27	52	Changed Organization 1. Deleted : COO 2. Change : Manufacturing Master Team(all), Manufacturing Mechanic Team (parts) → SCM Team (Products control (parts, welding material, etc), Cleaning, Painting, packaging, and product delivery 2. New : CTO, CSO, Management Planning Department, Manufacturing Innovation Department, Procurement Infrastructure Department, Value Sales Department, Growth Strategic Department, System R&D Team, Product Development Team, SCM Team, QC Team, Sales 1 Team, Sales 2 Team, Sales 3 Team	

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Prepared by	Reviewed by	Approved by
T. J. Park	J. S. Kim	S. J. Byun
QA Team Engineer (27 APR, 2026)	QA Manager (27 APR, 2026)	CEO (27 APR, 2026)

1. Scope

This Management Manual specifies and documents a effective implementing method of the SHEQ management system to establish, document, implement, maintain and continually improve a SHEQ management system of PK Valve & Engineering Co., Ltd. (hereinafter referred to as "PKV&E"), and applies to the products, activities, and services specified below.

1) Design, development, production (Production includes casting, heat treatment, welding, non-destructive examination (NDE), machining, assembly, testing and inspection, and painting.) and supplying of valves and units (GATE, GLOBE, CHECK, BALL, PLUG, BUTTERFLY & GVU etc.)
2) Design, development, production and supplying of steel casting
3) SHE activities relating to the design, development, production and supplying of above products
4) Address : 80, Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea

Our management system includes all requirements of ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, PED 2014/68/EU, PE(S)R 2016, API Q1 10th Edition, API Spec 6D and API Std.600 & API Std.609.

2. References

This management manual includes the following references.

1) ISO 9000:2015 Quality Management System– Basic provisions and definitions
2) ISO 9001:2015 Quality Management System– Requirements
3) ISO 9004:2000 Quality Management System– Requirements
4) ISO 14001:2015 Environmental Management System– Requirements
5) ISO 14004:2004 Environmental Management System– General Guidelines on Principle, Systems and Support Techniques
6) ISO 45001:2018 health and safety management systems– Requirements
7) API Q1 10th Edition: Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry
8) API 6D 25th Edition: Specification for Pipeline Valves
9) API 600 14th Edition: Bolted Bonnet Steel Gate Valves
10) API 609 9th Edition : Butterfly Valves : Double-flanged, Lug-and Wafer-type, and Butt-welding Ends
11) PED 2014/68/EU Pressure Equipment Directive
12) PE(S)R 2016 The Pressure Equipment (Safety) Regulations 2016

3. Definitions

For the purpose of this Management Manual, except the followings, the terms and definitions presented above apply.

1) SHEQ management system
A management system to direct and management a company in connection with safety, health, environment,

and quality activities (hereinafter referred to as "management system")

4. Context of the organization

4.1 Understanding the organization and its context

1) The PK V&E shall determine external and internal issues that are relevant to its purpose and its strategic direction and that affect its ability to achieve the intended result(s) of its quality
2) The PK V&E shall monitor and review information about these external and internal issues.
3) For SHE, such issues shall include SHE conditions being affected by or capable of affecting the PK V&E.
4) Positive or negative factors or consideration conditions may be included in the issue. Issues are composed of external issues and internal issues, external issues have issues arising from legal, technical, competitive, market, cultural, social and economic environments. Internal issues have issues related to PK V&E's values, culture, knowledge and performance. The PK V&E shall determine internal and external issues in consideration of PK V&E's characteristics and capabilities.

4.2 Understanding the needs and expectations of interested parties and workers

PK V&E's ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, the PK V&E shall determine:

1) the workers and other interested parties that are relevant to the SHEQ management system.
2) the relevant requirements, needs and expectations requirements of workers and other interested parties.
3) PK V&E's compliance obligations arising from needs and expectations related to the SHE.
4) Applicable team shall review information on stakeholders and their related needs in connection with the PK V&E's situation and manage by reflecting in the improvement plan after the risk is determined for the identified needs and expectations.
5) The principal team and each team manager decide risks by considering the understanding the organization and its context and needs and expectations of interested parties.

4.3 Determining the scope of the management system

1) The PK V&E shall determine the boundaries and applicability of the management system to establish its scope. When determining this scope, the PK V&E shall consider and scope is described paragraph 1.0
   (1) the external and internal issues for understanding the situation
   (2) the requirements of relevant interested parties and terms of compliance in the environment
   (3) In the case of environment, safety and health, unit, function and physical boundary
   (4) Activities, products and services
   (5) The authorities and abilities to administer and influence
2) The all requirements of management system shall be applied if they are applicable within the determined scope of its management system.
3) The scope of management system shall be available and be maintained as documented information. The

scope shall state the types of products and services covered, and provide justification for any requirement of this Management Manual that the organization determines is not applicable to the scope of this Management Manual.
4) Conformity to this Management Manual may only be claimed if the requirements determined as not being applicable do not affect the PK V&E's ability or responsibility to ensure the conformity of products and services and the enhancement of customer satisfaction.

4.4 Management System and processes

1) The PK V&E shall establish, implement, maintain and continually improve a management system, including the processes needed and their interactions, in accordance with the requirements of applicable Standard.
2) The PK V&E shall determine the processes needed for the management system and their application throughout the PK V&E, and shall:
   (1) determine the inputs required and the outputs expected from these processes;
   (2) determine the sequence and interaction of these processes;
   (3) determine and apply the criteria and methods (including monitoring, measurements and related performance indicators) needed to ensure the effective operation and control of these processes;
   (4) determine the resources needed for these processes and ensure their availability and consider the contractor and outsourcing activities.
   (5) assign the responsibilities and authorities for these processes;
   (6) address the risks and opportunities as determined in accordance with the requirements of risk control
   (7) evaluate these processes and implement any changes needed to ensure that these processes achieve their intended results;
   (8) improve the processes and the management system.
3) To the extent necessary, the PK V&E shall:
   (1) maintain documented information to support the operation of its processes;
   (2) retain documented information to have confidence that the processes are being carried out as planned.
4) Control of management manual
   (1) The management manual shall be prepared by QA Team Engineer, reviewed by the QA Manager and approved by the CEO.
   (2) QA Team Engineer shall distribute the controlled copy of approved management manual to applicable Team and other necessary organizations.
   (3) QA Team Engineer shall keep the distribution status of controlled copies for management manual.
5) The management manual shall be implemented, maintained and improved in accordance with applicable procedures that describe details of process.

5. Leadership

5.1 Leadership and commitment

5.1.1 General
The CEO shall demonstrate leadership and commitment with respect to the management system by:

scope shall state the types of products and services covered, and provide justification for any requirement of this Management Manual that the organization determines is not applicable to the scope of this Management Manual.

4) Conformity to this Management Manual may only be claimed if the requirements determined as not being applicable do not affect the PK V&E's ability or responsibility to ensure the conformity of products and services and the enhancement of customer satisfaction.

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   (3) determine and apply the criteria and methods (including monitoring, measurements and related performance indicators) needed to ensure the effective operation and control of these processes;
   (4) determine the resources needed for these processes and ensure their availability and consider the contractor and outsourcing activities.
   (5) assign the responsibilities and authorities for these processes;
   (6) address the risks and opportunities as determined in accordance with the requirements of risk control
   (7) evaluate these processes and implement any changes needed to ensure that these processes achieve their intended results;
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4) Control of management manual
   (1) The management manual shall be prepared by QA Team Engineer, reviewed by the QA Manager and approved by the CEO.
   (2) QA Team Engineer shall distribute the controlled copy of approved management manual to applicable Team and other necessary organizations.
   (3) QA Team Engineer shall keep the distribution status of controlled copies for management manual.
5) The management manual shall be implemented, maintained and improved in accordance with applicable procedures that describe details of process.

5. Leadership

5.1 Leadership and commitment

5.1.1 General
The CEO shall demonstrate leadership and commitment with respect to the management system by:

6) includes a commitment to provide safe and healthy working conditions for the prevention of work-related injury and ill health
7) includes a commitment to eliminate hazards and reduce OH&S risks
8) includes a commitment to meet consultation and participation of workers and PK V&E's compliance obligations
9) includes a commitment to continual improvement of the SHEQ management system;
10) includes a commitment to consultation and participation of workers, and where they exist, workers' representatives.

5.2.2 Communicating the quality, environment, safety and health policy
The quality, environment, safety and health policy shall
1) be available and be maintained as documented information;
2) be communicated, understood and applied within the PK V&E;
3) be available to relevant interested parties, if necessary.

5.2.3 Control of management policy
Quality policy shall be controlled by the QA Manager and environment, safety and health policy shall be controlled by Management Supporting Team Manager.

5.3 Organizational roles, responsibilities and authorities

The CEO shall ensure that the responsibilities and authorities for management system are assigned, communicated and understood throughout the organization. He shall assign the responsibility and authority for:
1) ensuring that the management system conforms to the requirements of applicable Standard;
2) ensuring that the processes are delivering their intended outputs;
3) reporting on the performance of the management system and on opportunities for improvement to CEO
4) ensuring the promotion of customer focus throughout the PK V&E ;
5) ensuring that the integrity of the management system is maintained when changes to the management system are planned and implemented.

5.4 Consultation and participation of workers

1) The PK V&E shall establish, implement and maintain a process(es) for consultation and participation of workers (workers' representatives) all applicable levels and functions in the development, planning, implementation, performance evaluation and actions for improvement of the SHE management system.
2) The PK V&E shall :
   (1) provide mechanisms, time, training and resources necessary for consultation and participation;
   (2) provide timely access to clear, understandable and relevant information about the OH&S management system;
   (3) determine and remove obstacles or barriers to participation and minimize those that cannot be removed.

Obstacles and barriers can include failure to respond to worker inputs or suggestions, language or literacy barriers, reprisals or threats of reprisals and policies or practices that discourage or penalize worker participation.

3) emphasize the consultation of non-managerial workers on the following:
(1) determining the needs and expectations of interested parties
(2) establishing the OH&S policy
(3) assigning organizational roles, responsibilities and authorities as applicable
(4) determining how to fulfil legal requirements and other requirements
(5) establishing OH&S objectives and planning to achieve them
(6) determining applicable controls for outsourcing, procurement and contractors
(7) determining what needs to be monitored, measured and evaluated
(8) planning, establishing, implementing and maintaining an audit programe(s)
(9) continual improvement activities are implemented in consultation with workers
4) emphasize the participation of non-managerial workers in the following:
(1) determining the mechanisms for their consultation and participation
(2) identifying hazards and assessing risks and opportunities
(3) determining actions to eliminate hazards and reduce OH&S risks
(4) determining competence requirements, training needs, training and evaluating training
(5) determining what needs to be communicated and how this will be done
(6) determining control measures and their effective implementation and use
(7) investigating incidents and nonconformities and determining corrective actions
(8) ensuring participation through other potential risk discovery, TBM activities, and safety and health committee activities

6. Planning

6.1 Actions to address risks and opportunities

6.1.1 When planning for the management system, the PK V&E shall consider the issues referred to in paragraph 4.1 and 4.2 and determine the risks and opportunities that need to be addressed to:
1) give assurance that the SHEQ management system can achieve its intended result(s);
2) enhance desirable effects;
3) prevent, or reduce, undesired effects including external potentials that affect the organization;
4) achieve continual improvement.
5) Environment, safety and health aspects
6) Consider all compliance obligations

6.1.2 PK V&E shall plan

1) actions to address these risks and opportunities;
2) how to :
(1) integrate and implement the actions into management system processes
(2) evaluate the effectiveness of these actions.
3) Actions taken to address risks and opportunities shall be proportionate to the potential impact on the conformity of products and services.
4) Within the scope of the SHEQ management system, the management supporting team shall determine potential emergency situations, including those that can have an environmental impact when risk assessment and maintained in an emergency response process.
5) When determining the risks and opportunities to the OH&S management system and its intended outcomes that need to be addressed, the management supporting team shall take into account;
(1) hazards
(2) OH&S risks and other risks
(3) OH&S opportunities and other opportunities
(4) legal requirements and other requirements
6) The processes and actions necessary to determine and address opportunities (section 6.1.5, 3) and decision risks and opportunities shall be maintained as documented information
7) Opportunities can lead to the adoption of new practices, launching new products, opening new markets, addressing new clients, building partnerships, using new technology and other desirable and viable possibilities to address the PK V&E's or customer's needs.

6.1.3 Determination of environmental aspect, risk factor, risk assessment and control method (environment, safety and health)
6.1.3.1 Hazard identification, assessment of risks and opportunities
The management supporting team shall establish, implement and maintain a process(es) for continual and active hazard identification. The process(es) shall take into account but not be limited to:
1) how work is organized social factors (including workload, work hours, victimization, harassment and bullying), leadership and the culture in the organization;
2) routine and non-routine activities and situations, including hazards arising from:
(1) infrastructure, equipment, materials, substances and the physical conditions of the workplace;
(2) product and service design, research, development, testing, production, assembly, construction, service delivery, maintenance and disposal;
(3) human factors;
(4) how the work is performed;
3) past relevant incidents, internal or external to the PK V&E, including emergencies, and their causes;
4) potential emergency situations;
5) people, including consideration of:
(1) those with access to the workplace and their activities, including workers, contractors, visitors and other persons;
(2) those in the vicinity of the workplace who can be affected by the activities of the PK V&E;

(3) workers at a location not under the direct control of the PK V&E;

6) other issues, including consideration of:

(1) the design of work areas, processes, installations, machinery/equipment, operating procedures and work organization, including their adaptation to the needs and capabilities of the workers involved;

(2) situations occurring in the vicinity of the workplace caused by work-related activities under the control of the PK V&E;

(3) situations not controlled by the PK V&E and occurring in the vicinity of the workplace that can cause injury and ill health to persons in the workplace;

7) actual or proposed changes in organization, operations, processes, activities and OH&S management system

8) changes in knowledge of, and information about, hazards.

6.1.3.2 Assessment of OH&S risks and other risks to the OH&S management system

1) Within the defined scope of the environmental management system, the PK V&E shall determine the environmental aspects of its activities, products and services that it can control and those that it can influence, and their associated environmental impacts, considering a life cycle perspective.

(1) assess OH&S risks from the identified hazards, while taking into account the effectiveness of existing controls;

(2) determine and assess the other risks related to the establishment, implementation, operation and maintenance of the OH&S management system.

2) The organization's methodology(ies) and criteria for the assessment of OH&S risks shall be defined with respect to their scope, nature and timing to ensure they are proactive rather than reactive and are used in a systematic way. Documented information shall be maintained and retained on the methodology(ies) and criteria.

3) Assessment of OH&S opportunities and other opportunities to the OH&S management system

The PK V&E shall establish, implement and maintain a process(es) to assess:

(1) OH&S opportunities to enhance OH&S performance, while taking into account planned changes to the organization, its policies, processes or its activities and:

(2) opportunities to adapt work, work organization and work environment to workers;

(3) opportunities to eliminate hazards and reduce OH&S risks;

(4) other opportunities for improving the OH&S management system.

(5) assessment of opportunities is managed by reflecting in the process of organization's context identification, risks and determination of opportunities because OH&S risks and OH&S opportunities can result in other risks and other opportunities to the organization.

4) The methodology of risk assessment and determining controls

(1) the company methodology for hazard identification and risk assessment shall:

a) be defined with respect to its scope, nature and timing to ensure it is proactive rather than reactive;

b) provide hazard identification, priority setting, documentation and applied pan of proper management.

(2) for the management of change, the company shall identify OH&S hazard and risks associated with changes in the organization, OH&S management system, or its activities, prior to the introduction of such changes.

(3) When determining controls, they shall ensure that the results of these assessments are considered. When determining controls, or considering changes to existing controls, consideration shall be given to reducing the risks according to the following hierarchy.

a) elimination

b) substitution

c) engineering controls

d) signage/warning and/or administrative controls

e) personal protective equipment.

(4) The company shall ensure that the significant risks are taken into account in establishing, implementing, and maintaining its management system, and keep it up to date.

5) Regular risk assessment shall be carried out at least once a year.

6) Hazard identification, risk assessment and risk control shall follow "Risk Assessment Procedure"

6.1.3.3 Environmental aspects

1) Within the defined scope of the environmental management system, the PK V&E shall determine the environmental aspects of its activities, products and services that it can control and those that it can influence, and their associated environmental impacts, considering a life cycle perspective.

2) When determining environmental aspects, the PK V&E shall take into account:

(1) change, including planned or new developments, and new or modified activities, products and services;

(2) abnormal conditions and reasonably foreseeable emergency situations.

3) The PK V&E shall determine those aspects that have or can have a significant environmental impact, i.e. significant environmental aspects, by using established criteria.

4) The management supporting team shall communicate its significant environmental aspects among the various levels and functions of the organization, as appropriate.

5) The management supporting team shall maintain documented information of its:

(1) environmental aspects and associated environmental impacts;

(2) criteria used to determine PK V&E's significant environmental aspects;

(3) significant environmental aspects;

6) Significant environmental aspects can result in risks and opportunities associated with either adverse environmental impacts (threats) or beneficial environmental impacts (opportunities).

7) Regular environmental impacts assessment shall be carried out at least once a year.

8) Environmental impacts assessment shall follow "Environmental Impacts Assessment Procedure".

6.1.4 Compliance obligations

1) The management supporting team shall:

(1) determine and have access to the compliance obligations related to its environmental aspects;

(2) determine how these compliance obligations apply to the PK V&E;

(3) take these compliance obligations into account when establishing, implementing, maintaining and continually improving PK V&E's environmental management system.

2) The management supporting team shall maintain documented information of PK V&E's compliance

obligations.
3) Compliance obligations can result in risks and opportunities to the PK V&E.

6.1.5 Planning action
1) Each Team Manager shall plan for opportunities of quality and environment risk determined above 6.1.1.
   (1) significant environmental aspects, compliance obligations, and take actions to address risks and opportunities
   (2) Actions to address risks and opportunities shall be integated the management system process (action plan) and it shall be implemented. As an action method of risk and opportunity, it shall be included in annual business plan of each team.
   (3) The effectiveness evaluation for actions of determined risks and opportunities shall be implemented a monthly or quarterly.
   (4) Actions to address risks and opportunities should correspond to the potential impact on the suitability of the product and service and it should take into account the technical options, financial, operational and business requirements of the PK V&E.
2) Options to address risks include risk avoidance, risk mitigation to capture opportunities, elimination of risk factors, change of possibility or result, risk sharing, or risk-based decision.
3) Opportunities can lead to adoption of new practices, new product launches, new market development, creation of new customers, building partnerships, leveraging new technologies, and other desirable and viable options for dealing with PK V&E or customer needs.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Planning Control, Risk Assessment, Contingency planning

6.2 Objectives and planning to achieve them

6.2.1 Objectives
The PK V&E shall establish quality objectives at relevant functions, levels and processes needed for the management system.
1) The objectives shall:
   (1) be consistent with the management policy;
   (2) be measurable;
   (3) take into account applicable requirements (including legal requirements), the results of the assessment of risks and opportunities, the result of consultation with workers
   (4) be relevant to conformity of products and services and to enhancement of customer satisfaction;
   (5) be monitored and assessed;
   (6) be communicated;
   (7) Company's technological alternatives, requirements of financial, operational and business and needs of interested parties
   (8) be updated as appropriate.
2) The organization shall maintain documented information on the objectives.

6.2.2 Planning how to achieve objectives
When planning how to achieve its objectives, the PK V&E shall determine:
1) what will be done;
2) what resources will be require;
3) who will be responsible;
4) when it will be completed;
5) how the results will be evaluated.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Planning Control, Objective and Management Review

6.3 Planning of changes

When the PK V&E determines the need for changes to the management system, the changes shall be carried out in a planned and systematic manner and PK V&E shall consider:
1) the purpose of the changes and their potential consequences;
2) the integrity of the quality management system;
3) the availability of resources;
4) the allocation or reallocation of responsibilities and authorities.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Planning Control, MOC Control

7. Support

7.1 Resources

7.1.1 General
The PK V&E shall determine the resources needed for the establishment, implementation, maintenance and continual improvement of the management system. The PK V&E shall consider:
a) the capabilities of, and constraints on, existing internal resources;
b) what needs to be obtained from external providers.

Resources include manufacturing facilities (including equipment and tools), management facilities (including computer programs), personnel, and external suppliers (if necessary). Based on management review, necessary resources shall be determined and controlled.

7.1.2 Personnel

The PK V&E shall determine and provide the persons necessary for the effective implementation of management system and for the operation and control of its processes. Responsibilities and authorities are as follows

1) CEO

The CEO has overall responsibilities for all items constructed by PK V&E, for establishment of management policy, and for the support of establishment and implementation of the management system. He shall demonstrate leadership and commitment to the establishment, implementation, maintenance, and improvement of the quality management system by:

(1) approving establishment of quality objectives (see) at relevant functions and levels within the organization;
(2) providing resources needed for the management system;
(3) engaging and supporting personnel in the implementation and maintenance of the management system; and
(4) assigning responsibilities and authorities for ensuring the processes achieve intended outputs.

2) Management representative

The CEO shall appoint ***the CTO***. as a management representative who, irrespective of other responsibilities, shall have the authority and responsibility to

(1) ensuring that the quality management system conforms to the requirements of this specification;
(2) ensure that the process necessary to management system is established, implemented, and maintained;
(3) report the result of quality management system and the needs of improvement to the CEO;
(4) ensuring initiation of action(s) to address nonconformities and;
(5) ensuring the promotion of awareness of customer requirements throughout the organization.

3) ***CFO***

(1) He has overall responsibility for human resource, work, accounting and PK V&E's requlatory control.
(2) He is accountable to the CEO and reporting to him is each Team Manager.

4) CTO

(1) He has overall responsibility for design, production and facility maintenance.
(2) He has responsibility for the administration of design, production and facility maintenance for the compliance with Customer requirements and the Management Manual.
(3) He is accountable to the CEO and reporting to him is Manufacturing Innovation Division Manager.

5) CSO

(1) He has overall responsibility for marketing activities, including customer document review, bidding, contract, and communication between the customer and PK V&E.
(2) He is accountable to the CEO and reporting to him is the Sales Team Manager.

6) CTO

(1) He has overall responsibility for new product development, identification of new items, national R&D support projects, patents and other industrial property rights, purchasing, product control, and shipment.

(2) He is accountable to the CEO and reporting to him is R&BD Center Manager and Procurement Infrastructure Division Manager.

7) Management Planning Department Manager

He is accountable to the CSO and reporting to him is Management Supporting Team Manager and Financial Planning Team Manager.

8) Manufacturing Innovation Department Manager

He is accountable to the CTO and reporting to him is Manufacture Engineering Team Manager, Manufacturing Cluster Team Manager, Manufacturing Prime Team Manager and Manufacturing Mechanic Team Manager.

9) Procurement Infrastructure Department Manager

He is accountable to the CTO and reporting to him is Procurement Innovation Team Manager and SCM Team Manager.

10) Value Sales Department Manager

He is accountable to the CSO and reporting to him is Sales Team Manager (Sales 1, Sales 2 Team).

11) Growth Strategic Department Manager

He is accountable to the CSO and reporting to him is Sales Team Manager (Sales 3 Team).

12) R&BD Center Manager (R&BD Manager)

He has overall responsibility for the new design of the valves including the following and for review of Customer documents in respect of design elements.

(1) valve design and development;
(2) New product development and discovery of new business items
(3) Development of state-supported projects (materials and valves)
(4) patent rights and other industrial ownership related activities

13) Manufacture Engineering Team

(1) valve design
(2) establishment of standards (products, power plant valves, new design products);
(3) valve-related external standard control;
(4) drawings control for products(valves), power plant valves;
(5) parts code control;
(6) material request activity;
(7) preparation of welding procedure specification;
(8) patent rights and other industrial ownership related activities;
(9) valve manufacture engineering activities.

14) Management Supporting Team Manager

(1) accounting business;
(2) establishment of business plan;

(3) business information related activity;
(4) computer related activity;
(5) presiding of management meeting.
(6) work coordination between organizations;
(7) personnel and labor management;
(8) regulation control;
(9) external indoctrination and training
(10) presiding of fire fighting, safety, environment and health activities;
(11) presiding of risk assessment;
(12) establishment of safety, health and environment objectives;
(13) grasping, reviewing and registering of safety, health and environment legal and other requirements.

15) QA Manager
(1) establishment, maintenance and control of management system;
(2) establishment of quality objectives;
(3) certification of external management system;
(4) qualification and certification of personnel (Auditor, QC Personnel)
(5) evaluation of suppliers;
(6) internal and external audit activities;

16) QC Manager
(1) control of measuring and test equipment;
(2) inspection and testing activities;
(3) non-conformance items control

17) Manufacturing Cluster Team Manager
(1) establishment of production schedule and tantalizations of performance records;
(2) issue of work order sheet;
(3) production processes adjustment and delivery time control;

18) Manufacturing Prime Team Manager
He is accountable to ***the Manufacturing Innovation Department Manager*** and has responsibility for manufacturing of casting, repair welding for casting material, qualification of the Heat Treatment Operator and laboratory control.

19) Manufacturing Mechanic Team Manager
He is accountable to ***the Manufacturing Innovation Department Manager*** and has responsibility for machining, welding, and assembly.

20) Manufacture Infrastructure Team Manager
He is accountable to ***the Manufacturing Innovation Department Manager*** and has responsibility for facility and manufacturing facility control.

21) Procurement Innovation Team Manager
He is accountable to ***the Manufacturing Innovation Department Manager*** and has overall responsibility

for the approval of Purchase Order, interface between PK V&E and Vendor.

22) SCM Team Manager
He is accountable to the Manufacturing Innovation Department Manager and has overall responsibility for the material control, cleaning, painting, packaging and shipment control.

23) Product Development Team Manager
He is accountable to the R&BD Manager and has overall responsibility for the development and design of new valves.

24) System R&D Team Manager
He is accountable to the R&BD Manager and has overall responsibility for the development and design of units.

25) Sales1, Sales 2 Team Manager
He is accountable to the Value Sales Department Manager and is responsible for contract review, customer control, for petrochemical, shipbuilding & offshore, and other products.

26) Sales 3 Team Manager
He is accountable to the Growth Strategic Department Manager and is responsible for contract review, customer management for nuclear products, as well as identifying new business opportunities.

27) Common works
(1) risk assessment and environmental impact assessment connected with the Dept. (Team);
(2) establishment and implementation of SHEQ detail targets and progress plan;
(3) compliance of legal and other requirements.
(4) implementation of education and training connected with the Dept. (Team)

7.1.3 Infrastructure
The organization shall determine, provide and maintain the infrastructure necessary for the operation of its processes to achieve conformity of products and services. The infrastructure shall include.
1) buildings and associated utilities;
2) equipment, including hardware and software;
3) transportation resources
4) information and communication technology

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Facility and Resource Control

7.1.4 Environment for the operation of processes

The organization shall determine, provide and maintain the environment necessary for the operation of its processes and to achieve conformity of products and services. A suitable environment can be a combination of human and physical factors as follows. These factors can differ substantially depending on the products and services provided.

1) social (e.g. non-discriminatory, calm, non-confrontational);
2) psychological (e.g. stress-reducing, burnout prevention, emotionally protective);
3) physical (e.g. temperature, heat, humidity, light, airflow, hygiene, noise).

7.1.5 Monitoring and measuring resources

7.1.5.1 General

1) The PK V&E shall determine and provide the resources needed to ensure valid and reliable results when monitoring or measuring is used to verify the conformity of products and services to requirements.
2) The organization shall ensure that the resources provided:
   (1) are suitable for the specific type of monitoring and measurement activities being undertaken;
   (2) are maintained to ensure their continuing fitness for their purpose.
3) The organization shall retain appropriate documented information as evidence of fitness for purpose of the monitoring and measurement resources.

7.1.5.2 Measurement traceability

1) When measurement traceability is a requirement, or is considered by the ***QC team*** to be an essential part of providing confidence in the validity of measurement results, measuring equipment shall be:
   (1) verified or calibrated, or both, at specified intervals, or prior to *use,* against measurement standards traceable to international or national measurement standards. when no such standards exist, the basis used for calibration or verification shall be retained as documented information;
   (2) identified in order to determine their status;
   (3) safeguarded from adjustments, damage or deterioration that would invalidate the calibration status and subsequent measurement results.
2) The QA Team shall assess and record the validity of the previous measuring results when the equipment is found not to conform to requirements, and take appropriate action on the equipment and product affected.
3) The QA Team shall maintain the records of the result of the calibration and verification. Records shall be included as followings
   (1) equipment identifications including the measurement standard for calibration;
   (2) revisions following engineering changes;
   (3) any out-of-specification readings as received for calibration/verification;
   (4) an assessment of the impact of out-of-specification condition
   (5) notification to the customer if suspect product or material has been shipped.
4) The QA Team shall identify and control suitable environmental conditions for the calibrations, inspections, measurements and tests being carried out.
5) Where computer software is used for monitoring and measuring specified requirements, the capability of computer software shall be verified to satisfy the intended application. Such verification shall be carried out prior to the first use, and re-certified as necessary.
6) When the equipment is provided from a source external to the organization, including third-part, proprietary, employee- and customer-owned equipment, the organization shall verify that the equipment is suitable and provide evidence of conformity to the requirements of this requirement.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Measurement Equipment control

7.1.6 Organizational knowledge

1) The PK V&E shall determine the knowledge necessary for the operation of its processes and to achieve conformity of products and services. This knowledge shall be maintained and be made available to the extent necessary.
2) When addressing changing needs and trends, the PK V&E shall consider its current knowledge and determine how to acquire or access any necessary additional knowledge and required updates.
3) PK V&E's knowledge is knowledge specific to the PK V&E; it is gained by experience. It is information that is used and shared to achieve the PK V&E's objectives.
4) Organizational knowledge can be based on:
   (1) internal sources (e.g. intellectual property; knowledge gained from experience; lessons learned from failures and successful projects; capturing and sharing undocumented knowledge and experience; the results of improvements in processes, products and services);
   (2) external sources (e.g. standards; academia; conferences; gathering knowledge from customers or external providers).

7.2 Competence

PK V&E shall ;

1) determine the necessary competence for personnel performing work affecting conformity to product requirements and SHEQ management system, environment aspects and risk in accordance with the "Indoctrination/Training Procedure"
2) provide training or take other actions achieved the necessary competence, and evaluate the effectiveness of the actions taken by each team manager;
3) Each Team manager shall give qualification to the following personnel who control, perform, or verify the activities designated in management system, by specifying indispensable requisites on the basis of education, training, skill and experience, and individual qualification records of such personnel shall be documented:
   (1) quality control personnel including NDE personnel;
   (2) internal auditors;
   (3) welders/welding operators;
   (4) designers;
   (5) painting workers;
   (6) heat treatment operators;
4) Training includes the quality management system training and on-the-job training of personnel (including personnel of the contractors and sub-suppliers). The PK V&E should provide on-the-job training for personnel in any new or modified job affecting SHEQ aspects;
5) Maintain appropriate records of education, training, skills and experiences.

6) In case of API monogram 600, 6D products, personnel work affecting product quality shall notify customer for the result of nonconformance of quality requirements. In case of other products, she/he shall notify customer if required by contract.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Indoctrination and Training, Design and Development, Process control, Audit, Inspection and test

7.3 Awareness

The organization shall ensure that relevant persons doing work under the organizations control are aware of:
1) the SHEQ policy and relevant objective;
2) their contribution to the effectiveness of the SHEQ management system, including the benefits of improved SHEQ performance;
3) their contribution to the effectiveness of the SHEQ management system, including the benefits of improved performance;
4) the implications of not conforming with the management system requirements including the result that not implement compliance obligations.
5) incidents and the outcomes of investigations that are relevant to them
6) hazards, OH&S risks and actions determined that are relevant to them
7) the ability to remove themselves from work situations that they consider present an imminent and serious danger to their life or health, as well as the arrangements for protecting them from undue consequences for doing so.

7.4 Communication, participation and consultation

7.4.1 Internal communication
1) The CEO shall have internal communication about management policy, management objective, management review results, OH&S information, environmental aspects, quality trends, market trends of product, all kinds of information, production and business performance, customer satisfaction, improvement proposal results, etc.
2) For communications with employees for SHEQ information, the CEO shall ensure to
(1) involved in the development and review of policies and procedures to manage SHEQ aspects;
(2) consulted where there are any changes affect the SHEQ aspects of working place;
(3) represented on SHEQ matters.
3) The applicable team shall establish, implement and maintain the process(es) needed for the internal and external communications relevant to the SHEQ management system, including determining
(1) on what it will communicate;
(2) when to communicate;
(3) with whom to communicate:

(4) how to communicate
4) Internal communication methods include
(1) morning meeting and management meeting;
(2) posting on notice board or internal internet line;
(3) outputs from organization activities, or activity connections between organizations.

7.4.2 External communication
1) The Company shall determine the external communication for significant SHEQ aspects as needed, document the determinations, obtain the approval of the CEO in accordance with "SHE Communication Procedure", and then carry out the determinations.
2) The access to our SHEQ policies is given to external interested parties, and if necessary, the performance and activities of SHEQ may be released through official document, company homepage, and mass media.
3) SHEQ-related requirements of all interested parties shall be controlled and disposed by the pertinent Dept. (Team), and the decision-making be recorded and maintained.
4) Where it is necessary to monitor the perception of interested parties, the monitoring results shall be analyzed by means of questionnaire, and used for the improvement of our management system.
5) In the event of emergency, the Company shall contact relevant external organizations and receive their supports.

7.4.3 Participation and consultation
The Management Support Team Manager shall ensure workers participation for work process regarding following items related safety & health, this shall not be limited. In case of participation, employee representative(s) or employees can participate directly.

1) Hazard identification, risk assessments and determining control method.
2) Incident investigation
3) Policy, development and setting of objectives
4) Consultation for changes affecting their safety and health
5) Representation of safety and health matters
6) Affecting safety and health (If required), consultation with subcontractors

7.5 Documented information

7.5.1 General
1) The PK V&E's management system shall include:
(1) documented information required by reference standards;
(2) documented information determined by the PK V&E as being necessary for the effectiveness of the management system.
a) management policy and SHEQ objectives
b) management manual
c) procedure and instruction to implement management system
d) legal and other applicable requirements
2) The extent of documented information for a management system can differ from one organization to another due to:

(1) the size of organization and its type of activities, processes, products and services;
(2) the complexity of processes and their interactions;
(3) the competence of persons.

7.5.2 Creating and updating
When creating and updating documented information, the organization shall ensure appropriate:
1) identification and description (e.g. a title, date, author or reference number);
2) format (e.g. language, software version, graphics) and media (e.g. paper, electronic);
c) review and approval for suitability and adequacy.

7.5.3 Control of documented information
1) Documented information required by the management system and by reference standards shall be controlled to ensure:
   (1) it is available and suitable for use, where and when it is needed;
   (2) it is adequately protected (e.g. from loss of confidentiality, improper use, or Joss of integrity).
2) For the control of documented information, the PK V&E shall address the following activities, as applicable:
   (1) distribution, access, retrieval and use;
   (2) storage and preservation, including preservation of legibility;
   (3) control of changes (e.g. version control);
   (4) retention and disposition.
3) Documented information of external origin determined by the PK V&E to be necessary for the planning and operation of the management system shall be identified as appropriate, and be controlled.
4) Documented information retained as evidence of conformity shall be protected from unintended alterations.
5) Access can imply a decision regarding the permission to view the documented information only, or the permission and authority to view and change the documented information.

7.5.4 Record Control
1) The organization shall maintain a documented procedure to identify the controls and responsibilities needed for the identification, collection, storage, protection, retrieval, retention time, and disposition of records.
2) Records, including those originating from outsourced activities shall be established and controlled to provide evidence of conformity to requirements and the organization's management system.
3) Records shall remain legible, identifiable, and retrievable
4) Records shall be retained for a minimum of five years or as required by customer, legal, and other applicable requirements, whichever is longer.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Document control, Record control

8. Operation

8.1 Operational planning and control

The PK V&E shall plan, implement and control the processes needed to meet the requirements for the provision of products and services, and to implement the actions determined in Clause 6. By;
1) determining the requirements for the products and services;
2) establishing criteria for:
   (1) process
   (2) the acceptance of products and services;
   (3) determining the resources needed to achieve conformity to the product and service requirements;
   (4) implementing control of the processes in accordance with the criteria;
   (5) determining and keeping documented information to the extent necessary:
      a) to have confidence that the processes have been carried out as planned;
      b) to demonstrate the conformity of products and services to their requirements.
3) The output of this planning shall be suitable for the PK V&E's operations.
4) The PK V&E shall control planned changes and review the consequences of unintended changes, taking action to mitigate any adverse effects, as necessary.
5) The applicable Team shall ensure that outsourced processes are controlled.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Planning control, Process control, Purchase control

8.2 Requirements for products and services

8.2.1 Customer communication
Communication with customers shall include:
1) providing information relating to products and services;
2) handling enquiries, contracts or orders, including changes;
3) obtaining customer feedback relating to products and services, including customer complaints;
4) handling and controlling customer property;
5) establishing specific requirements for contingency actions, when relevant.

8.2.2 Determination of requirements related to products and services
1) The PK V&E shall ensure that all legal and regulatory requirements that apply to its products and services and the requirements considered necessary by the PK V&E are processed.
2) The PK V&E shall ensure that the claims for products and services can be met.

8.2.3 Determination of requirements related to products and services
1) The PK V&E shall ensure that it has the ability to meet the requirements for products and services to be offered to customers.

2) The PK V&E shall conduct a review before committing to supply products and services to a customer to include:
   (1) requirements specified by the customer, including the requirements for delivery and post-delivery activities;
   (2) requirements not stated by the customer, but necessary for the specified or intended use, when known;
   (3) requirements specified by the organization;
   (4) statutory and regulatory requirements applicable to the products and services;
   (5) contract or order requirements differing from those previously expressed.
3) The PK V&E shall ensure that contract or order requirements differing from those previously defined are Resolved.
4) The customer's requirements shall be confirmed by the Business Division before acceptance, when the customer does not provide a documented statement of their requirements.
5) The applicable team shall retain documented information, as applicable:
   (1) on the results of the review;
   (2) on any new requirements for the products and services.

8.2.4 Changes to requirements for products and services
When contract is changed, the Business Division shall notify the relevant team for changed requirements so that relevant persons are made aware of the changed requirements,

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Customer Process

8.3 Design and development of products and services

8.3.1 General
The Manufacture Engineering Team shall establish, implement and maintain a design and development process that is appropriate to ensure the subsequent provision of products and services.

8.3.2 Design and development planning
In determining the stages and controls for design and development, the Manufacture Engineering Team Center shall consider:
1) the nature, duration and complexity of the design and development activities;
2) the required process stages, including applicable design and development reviews;
3) the required design and development verification and validation activities;
4) the responsibilities and authorities involved in the design and development process;
5) the internal and external resource needs for the design and development of products and services;
6) the need to control interfaces between persons involved in the design and development process;
7) the need for involvement of customers and users in the design and development process;
8) the requirements for subsequent provision of products and services;
9) the level of control expected for the design and development process by customers and other relevant interested parties;

10) the documented information needed to demonstrate that design and development requirements have been met.
11) When design and development is outsourced, the Manufacture Engineering Team shall ensure that supplier provides objective evidence that requirements is met.

8.3.3 Design and development inputs
The Manufacture Engineering Team shall determine the requirements essential for the specific types of products and services to be designed and developed. The organization shall consider:
1) functional and performance requirements;
2) information derived from previous similar design and development activities;
3) statutory and regulatory requirements
4) standards or codes of practice that the PK V&E has committed to implement;
5) potential consequences of failure due to the nature of the products and services;
6) Inputs shall be adequate for design and development purposes, complete and unambiguous. Conflicting design and development inputs shall be resolved. The Manufacture Engineering Team shall retain documented information on design and development inputs.

8.3.4 Design and development controls
Design and development process shall be controlled to ensure that:
1) the results to be achieved are defined;
2) reviews are conducted to evaluate the ability of the results of design and development to meet requirements;
3) verification activities are conducted to ensure that the design and development outputs meet the input requirements;
4) validation activities are conducted to ensure that the resulting products and services meet the requirements for the specified application or intended use;
5) any necessary actions are taken on problems determined during the reviews, or verification and validation activities;
6) documented information of these activities is retained.
7) Design and development reviews, verification and validation have distinct purposes. They can be conducted separately or in any combination, as is suitable for the products and services of the organization.

8.3.5 Design and development outputs
1) Design and development output shall be provided in a form suitable for verification against the design and development input, and approved by personnel authorized to approve the applicable document prior to release.
2) Design and development output shall
   (1) meet the input requirements;
   (2) are adequate for the subsequent processes for the provision of products and services;
   (3) include or reference monitoring and measuring requirements, as appropriate, and acceptance criteria;
   (4) specify the characteristics of the products and services that are essential for their intended purpose and their safe and proper provision.

(5) include identification of, or reference to, products and/or components deemed critical to the design;
(6) include results of applicable calculations
3) Design and development outputs shall be documented;
4) Information for products and service provision can include details for the preservation of product.

8.3.6 Design and development changes
1) The Manufacture Engineering Team shall identify, review and control changes made during, or subsequent to, the design and development of products and services, to the extent necessary to ensure that there is no adverse impact on conformity to requirements.
2) The Manufacture Engineering Team shall retain documented information on:
(1) design and development changes;
(2) the results of reviews;
(3) the authorization of the changes;
(4) the actions taken to prevent adverse impacts.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Design and Development control

8.4 Control of externally provided processes, products and services

8.4.1 General
1) The PK V&E shall ensure that externally provided processes, products and services conform to requirements.
2) The PK V&E shall determine the controls to be applied to externally provided processes, products and services when:
(1) products and services from external providers are intended for incorporation into the PK V&E's own products and services;
(2) products and services are provided directly to the customer(s) by external providers on behalf of the PK V&E;
(3) a process, or part of a process, is provided by an external provider as a result of a decision by the PK V&E.
3) The PK V&E shall determine and apply criteria for the evaluation, selection, monitoring of performance, and re-evaluation of external providers, based on their ability to provide processes or products and services in accordance with requirements. The PK V&E shall retain documented information of these activities and any necessary actions arising from the evaluations.

8.4.2 Type and extent of control
1) The PK V&E shall ensure that externally provided processes, products and services do not adversely affect the organization's ability to consistently deliver conforming products and services to its customers.
2) The PK V&E shall:
(1) ensure that externally provided processes remain within the control of its quality management system;
(2) define both the controls that it intends to apply to an external provider and those it intends to apply to

the resulting output;
(3) take into consideration:
a) the potential impact of the externally provided processes, products and services on the organization's ability to consistently meet customer and applicable statutory and regulatory requirements;
b) the effectiveness of the controls applied by the external provider;
(4) determine the verification, or other activities, necessary to ensure that the externally provided processes, products and services meet requirements.

8.4.3 Information for external providers
1) The PK V&E shall ensure the adequacy of requirements prior to their communication to the external provider.
2) The PK V&E shall communicate to external providers its requirements for:
(1) the processes, products and services to be provided;
(2) the approval of :
a) products and services;
b) methods, processes and equipment;
c) the release of products and services;
(3) competence, including any required qualification of persons;
(4) the external provider's interactions with the PK V&E;
(5) control and monitoring of the external provider's performance to be applied by the PK V&E;
(6) verification or validation activities that the PK V&E or customer intends to perform at the external provider's premises.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Purchase Control, Vendor Evaluation and Selection

8.5 Production and service provision

8.5.1 Control of production and service provision
1) The PK V&E shall implement production and service provision under controlled conditions.
2) Controlled conditions shall include, as applicable:
(1) the availability of documented information that defines:
a) the characteristics of the products to be produced, the services to be provided, or the activities to be performed;
b) the results to be achieved;
(2) the availability and use of suitable monitoring and measuring resources;
(3) the implementation of monitoring and measurement activities at appropriate stages to verify that criteria for control of processes or outputs, and acceptance criteria for products and services, have been met;
(4) the use of suitable infrastructure and environment for the operation of processes;
(5) the appointment of competent persons, including any required qualification;
(6) the validation, and periodic revalidation, of the ability to achieve planned results of the processes for

production and service provision, where the resulting output cannot be verified by subsequent monitoring or measurement;
(7) the implementation of actions to prevent human error;
(8) the implementation of release, delivery and post-delivery activities.

8.5.2 Process Validation
1) Validation shall be conducted for the following process
(1) Welding
(2) Heat Treatment
(3) NDE
2) Process validation shall be conducted in accordance with applicable procedure.

8.5.3 Identification and traceability
1) The Production Division shall use suitable means to identify outputs when it is necessary to ensure the conformity of products and services. Details of identification and traceability shall be controlled in accordance with "Identification and Traceability Control Procedure"
2) The ***QC Team*** shall identify the status of outputs with respect to monitoring and measurement requirements throughout production and service provision.
3) The applicable worker shall attend to be not damage the identification and traceability mark of products if identification or traceability marks on product are obliterated or contaminated, the QC personnel shall replace after the review of the related records.
4) The applicable team shall control the unique identification of the outputs when traceability is a requirement, and shall retain the documented information necessary to enable traceability.

8.5.4 Property belonging to customers or external providers
1) The PK V&E shall exercise care with property belonging to customers or external providers while it is under the organizations control or being used by the organization. The Business Division shall notify the details of customer property to the relevant Team. The applicable Team shall identify, verify, protect and safeguard customers' or external providers' property provided for use or incorporation into the products and services.
The customer property provided for product realization shall be controlled in accordance with the "Product Control Procedure".
2) When the property of a customer or external provider is lost, damaged or otherwise found to be unsuitable for use, the organization shall report this to the customer or external provider and retain documented information on what has occurred. A customer's or external provider's property can include material components, tools and equipment, customer premises, intellectual property and personal data.

8.5.5 Preservation
1) The organization shall preserve the outputs during production and service provision, to the extent necessary to ensure conformity to requirements. Preservation can include identification, handling, contamination control, packaging, storage, transmission or transportation, and protection. The details shall be controlled in accordance with the "Product Control Procedure".
2) When transferring product, palette or firm ropes may be used. Machined surfaces shall be taken the appropriate action to prevent from damage.

3) Product in pending use or delivery shall be stored at the designated storage area to prevent damage or deterioration of product. The Manufacturing Master Team shall check the protection condition of product being received and dispatched to and from storage areas, take proper measures, and assess the condition of product in stock at appropriate intervals to detect deterioration and check records shall be maintained.
4) Product shall be firmly packaged to prevent damage during transportation by containing a desiccant and wrapping with vinyl to protect from moisture and dust. Packing boxes shall be identified with product name, quantity, and appropriate marking such as "Handle with Care".
5) Preservation and delivery of products shall be carried out as follows;
(1) Weld spatters produced during manufacturing process, NDE marking, or harmful contaminants for use shall be completely eliminated.
(2) The test fluids in the valve shall be drained, and where applicable, lubricated before shipment.
(3) External surfaces of valve that may occur corrosion or rusting shall be painted as required by customers or the PK V&E requirements, and the metal surfaces not being painted shall be applied with anticorrosive.
(4) Flanges and welded bevels shall be fastened firmly by using woods or plastics to prevent damage of the surface or inside.
(5) Where contractually specified, the protection of product quality shall be extended to include delivery to destination.

8.5.6 Post-delivery activities
1) The PK V&E shall meet requirements for post-delivery activities associated with the products and services.
2) In determining the extent of post-delivery activities that are required, the PK V&E shall consider as followings and post-delivery activities can include actions under warranty provisions, contractual obligations such as maintenance services, and supplementary services such as recycling or final disposal.
(1) statutory and regulatory requirements;
(2) the potential undesired consequences associated with its products and services;
(3) the nature, use and intended lifetime of its products and services;
(4) customer requirements;
(5) customer feedback.
3) The Strategy Business Division shall receive nonconformity of product after delivery, evaluate the nonconformity, discuss with customers and relevant Team, and take a proper measure.
4) The Strategy Business Division shall document the description of nonconformity and corrective action and report to the CEO.
5) The applicable Team shall take a proper measure against the effects of nonconforming products and their potential effects.

8.5.7 Management of Change (MOC)
8.5.7.1 General
1) The PK V&E shall maintain a process for MOC.
2) The PK V&E shall ensure that the integrity of the management system is maintained when changes to the management system is planned and implemented.
3) For MOC, the PK V&E shall identify the potential risks associated with the change and any required

approvals prior to the introduction of such changes.
4) The applicable team manager shall review and control changes for production or service provision, to the extent necessary to ensure continuing conformity with requirements.
5) The applicable team manager shall retain documented information describing the results of the review of changes, the persons authorizing the change, and any necessary actions arising from the review.
6) The PK V&E shall maintain records of MOC activities.

8.5.7.2 MOC Implementation
The PK V&E shall use the MOC process for any of the following that may negatively impact the quality of the product;
1) changes in organizational structure;
2) changes in key or essential personnel;
3) changes in critical suppliers; and/or
4) changes to the management system procedure, including changes resulting from corrective and preventive action

8.5.7.3 MOC Notification
The PK V&E shall notify relevant personnel, including the customer (when required by contract), of the change and residual or new risk due to changes that have either been initiated by the organization or requested by the customer.
The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Process control, Control of Identification and Traceability, Product Control
Management of Change (MOC)

8.6 Release of products and services

1) The ***QC Manager*** shall implement planned arrangements, at appropriate stages, to verify that the product and service requirements have been met.
2) The release of products and services to the customer shall not proceed until the planned arrangements have been satisfactorily completed, unless otherwise approved by a relevant authority and, as applicable, by the customer.
3) The QA Manager and Manufacturing Master Team Manager shall retain documented information on the release of products and services. The documented information shall include:
(1) evidence of conformity with the acceptance criteria;
(2) traceability to the person(s) authorizing the release.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Product Control, Inspection and test

8.7 Control of nonconforming products (outputs)

1) The QA Manager shall ensure that products (outputs) that do not conform to their requirements are identified and controlled to prevent their unintended use or delivery. And identification and control of nonconforming product shall be carried out in accordance with the "Nonconforming Product Control Procedure"
2) The PK V&E shall take appropriate action based on the nature of the nonconformity and its effect on the conformity of products and services. This shall also apply to nonconforming products and services detected after delivery of products, during or after the provision of services.
3) Nonconforming products (outputs) may be disposed one or more of the following ways:
(1) correction (repair or rework, use-as-is, reject or scrapped)
(2) segregation, containment, return or suspension of provision of products and services;
(3) informing the customer;
(4) obtaining authorization for acceptance under concession.
4) Conformity to the requirements shall be verified when nonconforming products(outputs) are corrected.
5) The PK V&E shall retain documented information that:
(1) describes the nonconformity;
(2) describes the actions taken;
(3) describes the concessions obtained;
(4) identifies the authority deciding the action in respect of the nonconformity.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Control of Nonconforming Item

8.8 Operational planning and control for SHE Management

8.8.1 Operational planning and control
1) The management supporting team shall establish, implement, control and maintain the processes needed to meet SHE management system requirements, and to implement the actions identified in 6.1 and 6.2 by:
(1) establishing SHE operating criteria for the process;
(2) implementing control of the process, in accordance with the operating criteria.
(3) process of eliminating hazards and reducing risks can be implemented in accordance with the management steps (hierarchy-removal, replacement, technical, training, administrative, management, wearing protective gear). This can be implemented as part or a combination of management steps
2) The management supporting team shall control planned changes and review the consequences of unintended changes, taking action to mitigate any adverse effects, as necessary.
3) The management supporting team shall ensure that outsourced processes are controlled or influenced. The type and extent of control or influence to be applied to the process shall be defined within the SHE management system.
4) Consistent with a life cycle perspective, the PK V&E shall:
(1) establish controls, as appropriate, to ensure that its environmental requirements are addressed in the design and development process for the product or service, considering each life cycle stage;

(2) determine its environmental requirements for the procurement of products and services, as appropriate;
(3) communicate its relevant environmental requirement to external providers, including contractors;
(4) consider the need to provide information about potential significant environmental impacts associated with the transportation or delivery, use, end-of-life treatment and final disposal of its products and services.
(5) control contractors and other visitors in the workplace, adapting work to workers
(6) make a documented procedure to control incident that do not comply with occupational safety and health policies and objectives due to lack of documented procedures.

5) The management supporting team shall maintain documented information to the extent necessary to have confidence that the SHE processes have been carried out as planned.
6) Operation and planning shall be controlled in accordance with management manual, environmental impact assessment procedure, risk assessment procedure, environmental operation management, safety and health management process and related procedures.

8.8.2 Management of change

1) The PK V&E shall establish a process(es) for the implementation and control of planned temporary and permanent changes that impact OH&S performance, including:
(1) new products, services and processes, or changes to existing products, services and processes, including:
(a) workplace locations and surroundings
(b) work organization
(c) working conditions
(d) equipment, work force
(2) changes to legal requirements and other requirements
(3) changes in knowledge or information about hazards and OH&S risks
(4) developments in knowledge and technology
2) The management supporting team shall review the consequences of unintended changes, taking action to mitigate any adverse effects, as necessary.

8.8.3 Procurement

The PK V&E shall establish, implement and maintain a process(es) to control the procurement of products and services in order to ensure their conformity to its OH&S management system.

1) Contractors
(1) The PK V&E shall coordinate its procurement process(es) with its contractors, to identify hazards and to assess and control the OH&S risks, arising from the:
(a) actors' activities and operations that impact the PK V&E;
(b) PK V&E's activities and operations that impact the contractors' workers;
(c) contractors' activities and operations that impact other interested parties in the workplace.
(2) The PK V&E shall ensure that the requirements of its OH&S management system are met by

contractors and their workers. The PK V&E's procurement process(es) shall define and apply occupational health and safety criteria for the selection of contractors. The occupational health and safety criteria for the selection of contractors can be included in the contractual documents.

2) Outsourcing
(1) The PK V&E shall ensure that outsourced functions and processes are controlled.
The PK V&E shall ensure that its outsourcing arrangements are consistent with legal requirements and other requirements and with achieving the intended outcomes of the OH&S management system.
(2) The type and degree of control to be applied to outsourcing processes shall be defined within the OH&S management system.

8.9 Emergency preparedness and response

1) The applicable team shall establish, implement and maintain the process needed to prepare for and respond to potential emergency situations identified in 6.1.1.
2) The applicable team shall:
(1) prepare to respond by planning actions to prevent or mitigate adverse environmental, safety and healthy impacts from emergency situations;
(2) respond to actual emergency situations;
(3) take action to prevent or mitigate the consequences of emergency situations, appropriate to the magnitude of the emergency and the potential environmental impact;
(4) periodically test the planned response actions, where practicable;
(5) periodically review and revise the process and planned response actions, in particular after the occurrence of emergency situations or tests;
(6) communicating relevant information and training related to emergency preparedness and response, as appropriate, to relevant interested parties, including persons working under its control.
(7) communicating and providing relevant information to all workers on their duties and responsibilities;
(8) taking into account the needs and capabilities of all relevant interested parties and ensuring their involvement, as appropriate, in the development of the planned response.
3) The applicable team shall maintain documented information to the extent necessary to have confidence that the process is carried out as planned.
4) Emergency preparedness and response shall be controlled in accordance with "Emergency Control Procedure"

9.0 Performance evaluation

9.1 Monitoring, measurement, analysis and evaluation

9.1.1 General

1) The pertinent team manager shall monitor, measure, analyze and evaluate for performance of SHEQ.
2) When Monitoring, measurement, analysis and evaluation, the PK V&E shall determine:

(1) what needs to be monitored and measured (legal requirements, risks and opportunities, objective, effectiveness of operational control);
(2) the methods for monitoring, measurement, analysis and evaluation needed to ensure valid results ; (If necessary)
(3) when the monitoring and measuring shall be performed;
(4) when the results from monitoring and measurement shall be analyzed and evaluated.

3) The PK V&E shall evaluate the performance and the effectiveness of the quality management system. The PK V&E shall retain appropriate documented information as evidence of the results.

9.1.2 Customer satisfaction

1) The Sale Division shall monitor customers' perceptions of the degree to which their needs and expectations have been fulfilled and determine the methods for obtaining, monitoring and reviewing this information.
2) The following methods can be included as a method for monitoring customer perceptions.
(1) customer surveys
(2) customer feedback on delivered products or services
(3) meetings with customers
(4) claims
(5) others (dealer reports, compliments, market-share analysis)

9.1.3 Evaluation of compliance

1) The management supporting team shall establish, implement and maintain the process needed to evaluate fulfilment of SHE compliance obligations.
2) The management supporting team shall conduct as following:
(1) Compliance evaluation shall be conducted once a year by the management supporting team and could be carried out during internal audit.
(2) Nonconformities which were detected by compliance evaluation shall be corrected by the applicable team.
(3) The PK V&E shall maintain knowledge and understanding of its compliance status.
3) The management supporting team shall retain documented information as evidence of the compliance evaluation result and details shall be conducted in accordance with Monitoring and measurement procedure.

9.1.4 Analysis and evaluation

1) The PK V&E shall analyze and evaluate appropriate data and information arising from monitoring and measurement.
2) The results of analysis shall be used to evaluate:
(1) conformity of products and services;
(2) the degree of customer satisfaction;
(3) the performance and effectiveness of the quality management system;
(4) if planning has been implemented effectively;
(5) the effectiveness of actions taken to address risks and opportunities;
(6) the performance of external providers;
(7) the need for improvements to the quality management system.

3) Methods to analyze data can include statistical techniques.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Monitoring and Measurement control, Inspection and test, Data Analysis

9.2 Internal audit

9.2.1 General

1) The PK V&E shall conduct internal audits at least every 12 months to provide information on whether the management system:
(1) conforms to:
a) the PK V&E's own requirements for management system;
b) the requirements of International Standard;
(2) is effectively implemented and maintained.
2) The PK V&E shall identify the audit criteria, scope, frequency, and methods to ensure that all processes of the management system.
3) Audit plan
(1) The QA Team shall establish the internal audit schedule on the basis of the status and importance of process and field to be audited and changes affecting the PK V&E as well as the results of previous audits. The Audit Plan shall identify the audit scope, requirements, audit personnel, activities to be audited, organization to be audited, applicable documents and schedule.
(2) Audits shall be performed under the responsibility of the lead auditor qualified to ensure the objectivity and fairness.
(3) Audit plan notify to the lead auditor and the organization to be audited.
(4) The lead auditor shall prepare audit checklist on the basis of the detail audit plan.
4) Qualification of auditors
(1) The audit personnel to be assigned shall be those who are independent of any direct responsibility for performing the activities which they will audit, and shall have sufficient authority and organizational freedom to make the audit process meaningful and effective. The audit personnel make full use of t technical language as far as it doesn't affect audit activities.
(2) The Lead Auditor shall confirm auditor qualification record that auditors have experience or training commensurate with the scope, complexity, special nature of activities to be audited
5) Auditing
(1) Auditors shall perform auditing against actual activities at the area to be audited on the basis of audit checklist prepared. Outsourced activities that impact the quality of the product and that are performed at the company facility shall be included as part of the internal audit.
(2) Auditors shall not be interfered in the audits being performed. The organization audited shall cooperate in auditing to make the audit process smoothly.
(3) The lead auditor shall notify the nonconformity and required action period audit findings to the audited organization to take corrective actions.
(4) The Lead Auditor shall prepare the audit report within ten (10) days after audit completion, and transmit it to the QA Manager. Audit Report shall include the followings.

a) Description of the audit scope
b) Identification of the Auditors.
c) Identification of personnel contacted on audit activities.
d) Summary of audit results
e) Description of each reported adverse audit finding in sufficient detail to enable corrective action to be taken by the audited organization.
f) Sign and date by the Lead Auditor.

(5) The audit report shall be approved by the QA Manager. But audit report for the QA Team and QA Team shall be approved by the CEO.

6) Follow-up actions

(1) The personnel responsible for audited activities shall take timely any necessary correction and corrective action to eliminate the deficiencies and causes found by the audit.

(2) Such follow-up actions shall be carried out in accordance with the corrective action procedure, including verification of action taken and reporting of verification results

(3) The QA Team shall take measures to verify the implementation and effectiveness of corrective actions performed during the next audit.

7) retain documented information as evidence of the implementation of the audit process and the audit results.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Audit

9.3 Management review

9.3.1 General

1) The CEO shall review at least every 12 months the PK V&E's management system to ensure its continuing suitability, adequacy, effectiveness and alignment.
2) Management reviews shall include assessing opportunities for improvement and the need for changes including the management policies and SHEQ objectives monitoring.
3) Each Team shall prepare the pertinent performance data and review output data for the following review inputs as management review data. Management review records shall be maintained in the form of report, minutes, etc.

9.3.2 Management review inputs

Management review inputs shall include

1) the status of actions from previous management reviews;
2) the following changes;

(1) external and internal issues that are relevant to the management system

(2) changes to legal and other applicable requirements (such as industry standards): and

(3) the needs and expectations of interested parties, including compliance obligations;

(4) its significant environmental aspects, hazard and risk factors

(5) the effectiveness of actions taken to address risks and opportunities

3) the extent to which SHEQ objectives have been met;
4) information and effectiveness on the PK V&E's SHEQ performance, including trends in:

(1) communication with relevant interested parties including complain (relevant feedback from customers and other interested parties)

(2) process performance and achievement of product suitability;

(3) nonconformities and corrective actions

(4) monitoring and measurement results for SHEQ;

(5) audit and follow-up action results;

(6) the performance of external providers;

(7) results of evaluation of compliance with legal requirements of SHE

(8) consultation and participation of workers, results of risk assessment and the effectiveness of actions taken to address risks;

5) the adequacy of resources;
6) opportunities for improvement;
7) the analysis of product conformity, including nonconformities identified after delivery or use

9.3.3 Management review outputs

1) The outputs of the management review shall include decisions related to:

(1) a summary assessment of the effectiveness of the quality management system

(2) any need for changes to the management system;

(3) decisions and actions

(4) required resources;

(5) any improvement to products in satisfying customer requirements.

(4) continuing suitability, adequacy and effectiveness of the OH&S management system;

(5) actions if management objective are not achieved.

(6) opportunities for improvement;

(7) actions, if needed, when environmental objectives have not been achieved

(8) opportunities to improve integration of the OH&S management system with other business processes, as necessary;

(9) any implications for the strategic direction of the PK V&E, integration of the processes,

2) The QA Team shall be retained the results of management documented information.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Objective and Management Review

10.0 Improvement

10.1 General

1) The PK V&E shall determine and select opportunities for improvement and implement any necessary actions to achieve the intended results of the management system and to meet customer requirements and enhance customer satisfaction.
2) These shall include:
   (1) improving products and services to meet requirements as well as to address future needs and expectations;
   (2) correcting, preventing or reducing undesired effects;
   (3) improving the performance and effectiveness of the management system.
3) Examples of improvement can include correction, corrective action, continual improvement, breakthrough change, innovation and re-organization.

10.2 Nonconformity and corrective action, incident investigation

10.2.1 Nonconformity and corrective action
1) When a nonconformity occurs, including any arising from complaints, the PK V&E shall react to the nonconformity and, as applicable:
   (1) take action to control and correct it;
   (2) deal with the consequences;
2) evaluate the need for action to eliminate the cause(s) of the nonconformity, in order that it does not recur or occur elsewhere, by:
   (1) reviewing and analyzing the nonconformity;
   (2) determining the causes of the nonconformity;
   (3) determining if similar nonconformities exist, or could potentially occur
3) The QA Team shall implement any action needed
4) The QA Team shall review the effectiveness of any corrective action taken
5) The QA Team shall update risks and opportunities determined during planning, if necessary
6) The QA Team make changes to the quality management system, if necessary.
7) The QA Team shall retain documented information as evidence of:
   (1) the nature of the nonconformities and any subsequent actions taken;
   (2) the results of any corrective action.

10.2.2 Incident investigation
1) PK V&E shall prepare establish, implement and maintain a procedure, which is recording, investigating and analyzing of incident, for following.
   (1) contributes or causes of incident occurrence, and deciding other elements and potential defects of safety and health;
   (2) needs of corrective action;
   (3) needs of preventive action;
   (4) opportunity for continual improvement;
   (5) communicating of investigation results.
2) Incident investigation shall be performed by appropriate method timely.
3) Any identified need for corrective action or opportunities for preventive action shall be dealt with in accordance with nonconformance and corrective action procedure. The results of incident investigation shall be documented and maintained.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures.

Related Procedure : Corrective and Preventive Action and Investigation, Control of Nonconforming Item

10.3 Continual improvement

1) The PK V&E shall continually improve the suitability, adequacy and effectiveness of the management system.
2) The PK V&E shall consider the results of analysis and evaluation, and the outputs from management review, to determine if there are needs or opportunities that shall be addressed as part of continual improvement.

The Details are described in the related procedures and are carried out and maintained in accordance with the related procedures

Related Procedure : Continuous Improvement

Annex 1> API Monogram Program: Responsibilities

1. In order to hold the rights to use API monogram, PK V&E shall observe
   1) the quality system requirements of API standard Q1;
   2) API monogram requirements of API standard Q1, Annex A;
   3) the requirements included in API 6D, API 600 and/or API 609 product standards;
   4) the requirements included in API License Agreement.

2. API specified requirement described in the API Specification Q1 including Annex A is mandatory for PK V&E to provide API monogrammed product.

3. PK V&E shall control the application of monogram as follows:
   1) The date of manufacture shall be two digits representing the month and two digits representing year
   2) API monogram may be applied at any time appropriate during the production process but shall be removed if the product is subsequently found to be nonconforming with API specified requirement. API monogram is not attached to the products determined to be nonconforming to API specified requirements.
   3) Only PK V&E shall apply API Monogram.
   4) The monogram shall be applied at PK V&E facility.
   5) The QC personnel of PK V&E has authority applying and removing the API Monogram.
   6) API monogram marking is carried out in accordance with the API Monogram Marking Control instruction, which document the marking requirements of API standards.

Annex 2> PED 2014/68/EU or PE(S)R 2016

1. This Annex applies the design, manufacturing, final inspection, and testing of valves as pressure equipment accessories that satisfy requirements of PED 2014/68/EU or PE(S)R 2016 module H.

2. The Company must affix the CE or UKCA marking to each item of valve and draw up a written declaration of conformity. The CE or UKCA marking must be accompanied by the identification number of the notified body.

3. The Company shall implement the quality system approved to ensure that valves meet the requirements of PED 2014/68/EU or PE(S)R 2016 Module H. Primary requirements of our quality system is to perform design, manufacturing, final inspection and testing that satisfy the requirements of PED 2014/68/EU or PE(S)R 2016 and provide the products and services satisfying all the requirements of PED or or PE(S)R 2016.

4. Valves must be designed, manufactured, and checked in such a way as to ensure its safety when it is used under reasonably foreseeable conditions. It must apply the principles set out below in the followings;
   (1) eliminate or reduce hazards as far as is reasonably practicable
   (2) apply appropriate protection measures against hazards which cannot be eliminated
   (3) where appropriate, inform users of residual hazards and indicate whether it is necessary to take appropriate special measures to reduce the risks at the time of installation and/or use..

5. Manufacture Engineering Team shall maintain Technical Design Specifications, including standards, that will be applied and, where the standards referred to in PED 2014/68/EU or PE(S)R 2016 are not applied in full, the means that will be used to ensure the essential safety requirements (ESR) of the PED 2014/68/EU or PE(S)R 2016.

6. In order to ensure that PED or PE(S)R 2016 essential safety requirements are met, the designer shall control and verify the design of valve in accordance with the design procedure of his QAM. The manufacturing and inspection of valves shall be controlled in accordance with corresponding manufacturing, QC/ QA techniques and relevant procedures set out at the design stage.

7. The PK V&E must inform the Notified Body that has approved the quality system of any intended adjustment to the quality system. The quality records and technical design specifications shall be retained for ten years after the completion of the last valve manufacturing. The quality records shall include the following documents and records approved and issued by a notified body;
   (1) approved quality system documents;
   (2) decision for notified body;
   (3) periodic audit report, unexpected visit reports;
   (4) where appropriate, EC type examination certificate, EC design examination certificate.

Annex 3> Organization Chart

