

첨부 2.

‘14년 주요기자재 제작업체 평가 제출서류

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※ 기술능력평가 서류 제출시 필히 품목, 규격별로 분리하여 주시기 바랍니다

※ 모든 서류는 Hardcopy 및 PDF파일을 같이 제출해 주시기 바랍니다.

Document List

I . Documents for evaluation of general status

1. Application for Prequalification
2. Company general status
3. Notice to the registered manufacturers

II . Business Information Report (original)

1. Foreign Manufacturer : Business Information Report of D&B (DUN & BRADSTREET)
2. domestic Manufacturer : Business Information Report of D&B (DUN & BRADSTREET)
or credit rating confirmation

III. Documents for evaluation of technical capability

1. Manufacturing Specification
2. Reference list(Application item, For the last 5)
3. Quality&Technical authentication list(Application item)
4. Manpower status (Application item)
5. Design Capacity(Application item)
6. Manufacturing equipment list(Application item)
7. Test & Inspection equipment list(Application item)
8. Work procedure, chart, standard(Application item)
9. Outsourcing list(Application item)
10. Organization for after-sales service(Application item)

- ※ When submitting document lists, Separate into an application item.
- ※ All documents shall be submitted Hardcopy and PDF computer files

I. 일반제출서류

1. 평가신청서

평 가 신 청 서

문서번호 :

수 신 : 한국가스공사 사장

참 조 : 안전품질실장

제 목 : '14년 주요기자재 제작업체 평가 신청

귀사의 주요기자재 제작업체로 선정되고자 아래와 같이
평가신청 합니다.

I. 평가신청품목 :

II. 해당규격 :

III. 제작업체명 :

첨 부 : 평가관련 제출서류 목록 및 제출서류 1식.

《 본 제출서류의 기재내용은 모두 사실이며 허위 기재사항이 제출후
발견시 평가대상업체에서 제외되며 선정업체로 선정 후에도 자격이
취소되고 어떠한 불이익도 감수함 》

회사명

대표이사

직 인

1. Application for Prequalification

Application for Prequalification

TO : KOGAS

Attention : Office of EHSQ

Subject : the year 2014 Application for Prequalification of Manufacturer

We hereby submit the Application and the related Document to Prequalify
as your Manufacturer

I . Name of Item :

II . Size or type :

III . Name of Applicant :

○ Attachment : Submission document 1 set

[Attached documents should be accurate and factual, any misrepresentation or
omission of facts will justify the cancellation of application]

Company Name

Representative Name & Signature

2. 업체현황

업 체 명				대 표 자	(인)		
본 사	주 소			대 지	평	건 평	연 평
	설립일	년. 월. 일	자가,임대	전 화	()		
제 공 1 장	주 소			대 지	평	건 평	연 평
	설립일	년. 월. 일	자가,임대	주생산물			
제 공 2 장	주 소			대 지	평	건 평	연 평
	설립일	년. 월. 일	자가,임대	주생산물			
R&D Center	주 소			대 지	평	건 평	연 평
	설립일	년. 월. 일	자가,임대	주생산물			
국내 .외 지사 현황	주소 및 설립 일자	① ② ③					
주된사업지의 사업자 등록		번호		업태		종목	
연간 매출액 국내 판매액 수출액		천원 or \$ 천원 or \$ 천원 or \$	주요생산제품 (총매출액대비 점유율)			매출액순위 1. (%) 2. (%) 3. (%)	
회사연혁		1. 신청품목 사업개시 일자					
		2. 최초 설립회사명 및 변경 이력사항(일자포함)					
		3. 모기업명					
		4. 주요연혁					

2. Company general status

Company Name				Representative Name & Signature			
Head Office	Address		Own or Rent			Size	
			Founded Year			Land	m ²
			Tel/Fax			Building	m ²
1st Factory	Address		Own or Rent			Size	
			Founded Year			Land	m ²
			Tel/Fax			Building	m ²
2nd Factory	Address		Own or Rent			Size	
			Founded Year			Land	m ²
			Tel/Fax			Building	m ²
R&D Center	Address		Own or Rent			Size	
			Founded Year			Land	m ²
			Tel/Fax			Building	m ²
Branch office of domestic and Overseas		Address & Founded Year		① ② ③			
Line of business							
Annual Sales		Annual Sales : ₩ or \$ Domestic Sales : ₩ or \$ Overseas Sales : ₩ or \$		Main products (Sales of amount of money ratio)		1. (%) 2. (%) 3. (%)	
Company profile		1. Commencement date of Application item					
		2. Establishment Name of company and change history (including the date)					
		3. Parent company					
		4. company history					

3. 주요기자재 제작업체 등록에 따른 유의서

제 1 조 (목적) 본 유의서는 한국가스공사(이하 “공사”라 함)가 “계약업무관리 지침” 및 “주요기자재 제작업체 평가, 등록 및 관리지침 <이하 “지침”이라함>에 의하여 평가결과 적합판정을 받아 주요기자재를 공급할 수 있는 자격을 갖춘 업체(이하 “등록업체”라 함)가 준수하여야 할 사항을 정함을 목적으로 한다.

제 2 조 (등록 자격 유효기간) 등록업체의 자격 유효기간은 특별한 사유가 없는 한 2017년 12월 11일로 하며, 필요시 등록유효기간 내에 재평가할 수 있다.

제 3 조 (입찰참가) ① 공사는 당해 물품 발주시 입찰 시행 등에 관한 사항을 등록업체별로 개별 통지하며, 등록업체는 신의와 성실의 원칙에 입각하여 이에 응하여야 한다.

② 공사는 등록업체에 제1항에 의한 통지서, 필요한 확인 및 서류 제출을 요청할 수 있으며, 등록업체는 이에 응하여야 한다.

③ 공사는 등록업체에 대하여 입찰보증금 납부를 면제할 수 있으며, 이 경우 지급각서로 대신한다.

④ 입찰참가 후 기술평가결과 요구수준을 충족하지 못할 경우 해당입찰결과를 부적합으로 할 수 있다.

제 4 조 (등록업체 취소 등) ① 공사는 다음 각 호의 1에 해당될 경우 등록업체의 자격을 취소할 수 있으며 자격이 취소된 업체는 취소일로부터 3년간 등록업체로 선정될 수 없다.

1. 적격자 선정을 위하여 평가시 요구된 제출 서류의 허위 등 부정한 방법으로 선정된 것이 판명될 때
2. 생산을 중단하였거나 제조능력을 유지하고 있지 않는 것이 확인된 경우
3. 등록업체가 공급한 자재의 심각한 결함으로 자재의 본 성능을 유지할 수 없어 공사에 손실을 초래하거나 그 현실적 우려가 발생한 경우
4. 기타 등록업체의 자격을 취소하는 것이 타당하다고 인정하는 경우

② 등록업체 자격정지

공사는 다음 각 호의 1에 해당될 경우 등록업체의 자격을 일정기간 정지할 수 있으며, 그 기간은 위원회의 의결을 2년 범위내에서 결정할 수 있다.

다만 필요하다고 인정할 경우 자격정지 기간과는 별도로 입찰참가 횟수를 제한할 수 있다.

1. 등록업체가 공급한 자재에 결함이 발생하여 자격제한 하는 것이 타당하다고 인정하는 경우
2. 하자보수처리 불성실 업체로서 당공사에 손실을 초래하였거나 초래할 우려가 있는 경우
3. 등록기간내 규격별로 2회 이상 특별한 사유없이 입찰에 불참하는 경우
4. 구매자가 발주한 물품을 등록기간내 계약상대자 귀책사유로 67일 이상 연체한 경우 또는 등록 기간내 연체일수가 30일 이상으로서 2회 이상 연체한 경우
5. 등록기간내 경영상 중대한 문제 발생한 경우
6. 등록기간내 ISO 자격이 박탈된 경우
7. 기타 등록업체의 자격을 제한하는 것이 타당하다고 인정하는 경우

③ 등록업체 경고

등록업체가 다음 각호의 1에 해당될 경우 경고조치 할 수 있다.

1. 등록업체가 공급한 자재에 경미한 결함이 발생한 경우
 2. 등록업체 자격제한 사항이나 발생사유, 건설공정피해, 제작능력 등을 감안하여 경고조치하는 것이 타당한 경우
 3. 기타 등록업체에게 경고조치하는 것이 타당하다고 인정하는 경우
- ④ 제1항에 의한 등록업체 취소, 제2항에 의한 자격정지 사항, 제3항에 의한 경고는 공사측 심의위원회의 의결을 거쳐 결정한다.
- ⑤ 제1항에 의하여 자격이 취소된 등록업체가 낙찰자로 결정되었을 때에는 당해 낙찰을 무효 처리한다.
- ⑥ 제1항에 의하여 자격이 취소된 등록업체와 체결한 계약건에 대하여 공사는 당해 계약을 해제 또는 해지할 수 있으며, 이 경우 계약보증금 전액은 공사에 귀속된다. 단, 공사가 입은 손실이, 귀속된 계약보증금 상당액을 초과하는 경우 등록업체는 공사에 이를 배상하여야 한다.
- ⑦ 등록기간내 당공사로부터 1회 이상의 경고 또는 자격정지를 받은 사실이 있는 경우로서 또다른 경고 또는 자격정지 사유가 발생한 경우에는 각각 자격정지 또는 자격취소를 할 수 있다.

제 5 조(등록사항의 변경 및 승인)다음 각호의 등록사항이 변경된 등록업체는 등록변경 신청을 하여야 한다.

1. 상호변경, 주소변경
2. 공장이전
3. 등록품목과 관련된 업체 인수, 합병, 매각
4. 등록품목과 관련된 설비 및 인력의 감축

제 6 조(예외적 추진사항) 다음 각호의 1에 해당하는 경우 공사는 등록업체가 아닌 다른 업체와 계약을 추진할 수 있다.

1. 등록업체를 대상으로 계약을 추진하였으나, 2회 이상 계속 유찰된 경우
2. 관련 법 또는 규정의 개정으로 등록업체와 계약을 추진하는 것이 불가능한 경우
3. 등록업체의 담합 및 제재 등으로 등록업체로서의 기자재 구매가 현격히 불리한 경우
3. 천재지변 기타 불가항력적인 사유로 불가피한 경우

제 7 조 (관련 법령의 적용) 공사와 등록업체간의 입찰 및 계약추진에 관한 사항은 다음의 순서에 따라 적용한다.

1. 주요기자재 제작업체 등록 및 관리지침서
2. 본 유의서
3. 입찰 안내서
4. 계약업무관리 지침
5. 국제상관례

확인일자:

○○회사

대표이사 : ○○○ (인)

3. Notice to the registered manufacturers

NOTICE TO THE REGISTERED MANUFACTURERS
WHICH ARE ELIGIBLE TO SUPPLY THE MAIN EQUIPMENTS
SPECIFIED BY KOGAS

Article 1 Purpose

The purpose of this notice is to govern the provisions to be abided by the Registered Manufacturers (hereinafter called "RM") which have been determined to be qualified and eligible to supply Korea Gas Corporation (hereinafter called "KOGAS") with the Main Equipments (hereinafter called "ME") satisfactorily in accordance with the Contract Regulations and the Prequalification Guidelines of the ME of KOGAS.

Article 2 Period of Validity of Registration

Registration as the registered manufacture shall remain valid until December 11, 2017. However KOGAS may re-evaluate the registered manufacture prior to the expiration of the period of registration if necessary.

Article 3 Participation in Bids

- 3.1 Whenever KOGAS invites the RM to take part in a competitive bid or a direct negotiation in order to purchase the ME in writings, the RM shall respond to the invitation in sincere and faithful manner.
- 3.2 Subject to the article 3.1 above, the RM shall submit the whole documents for a project required by KOGAS.
- 3.3 The RM is allowed to submit a Memorandum of Payment to KOGAS instead of establishing and submitting a bid security issued by a financial institute.
- 3.4 If a RM fails to meet the technical requirements under the bids which need detailed technical evaluations for a certain project in addition to the evaluation at registration, KOGAS has the right to declare the RM "Unsuitable" to the bid.

Article 4 Nullification or Restriction of the Eligibility of Registered Manufacturer

4.1 KOGAS shall have the right to nullify the eligibility of a RM in any case below. The nullified RM should not pass the prequalification held within 3 years since the notice of the nullification.

1. In case a RM is disclosed to have submitted the required documents for assessment which are forged or made in any false manner
2. In case a RM discontinues manufacturing the ME or does not maintain the manufacturing capability
3. In case a ME produced by a RM has a significant defects
4. Other cases which KOGAS regards as reasonable to give a RM the nullification of eligibility

4.2 KOGAS shall have a right to suspend the eligibility of a RM for a certain period of time in any case below. The period of suspension determined by the KOGAS' Evaluation Committee shall vary from 1 month to 2 years.

but KOGAS could limit the opportunities of bidding instead of the period of suspension if necessary

1. If a MG supplied by a RM has a defect which KOGAS regards as enough to suspend the eligibility of the RM
2. If a RM is not faithful, capable of resolving the defects that may bring a loss on KOGAS
3. If a RM has been absent from the bids in which the RM is supposed to participate more than once without reasons acceptable by KOGAS
4. In case of unexcused delay exceeding 67 days per one contract or 30 days more than once by a RM in the performance of its delivery within period of validity of registration
5. If a RM is found to be in serious management difficulties or instability
6. If a RM is no longer to have a ISO qualification
7. Other cases which KOGAS regards as reasonable to give a RM the suspension of eligibility

4.3 KOGAS shall have the right to issue a warning to a RM in any case as specified below :

1. In case insignificant defects are found in a ME produced by a RM
2. Other cases which KOGAS regards as reasonable to give a RM the warning of eligibility

4.4 KOGAS shall have a right to nullify the eligibility of a RM in case a RM has had suspensions of validity more than once within the period of validity of registration and suspend the eligibility of a RM if a RM has received warnings issued by KOGAS more than once

4.5 The nullification and suspension of eligibility of, and warning to a RM as per Article 4.1, 4.2 and 4.3 shall respectively be determined by KOGAS' Evaluation Committee

4.6 If a contract is awarded to a RM whose eligibility has been nullified according to Article 4.1, the award shall become automatically ineffective.

4.7 KOGAS can terminate the contract made with a nullified RM, confiscate the performance security. In this regard, if any loss incurred from the termination is greater than the amount in the performance security, the nullified RM should indemnify KOGAS for such difference in amount.

Article 5 Change and Approval to Registration Facts

A RM shall notify KOGAS of the changed facts on its business entity relating to a ME.

1. Change of name and address
2. Moving of manufacturing factory
3. M&A or disposal
4. Downsizing in terms of manufacturing facilities and employee

Article 6 Exceptions

This notice may not be applied in such cases as specified hereunder.

And KOGAS can make a contract with unregistered manufactures

1. KOGAS fails to choose a successful bidder among RMs, even though KOGAS carry out bidding procedures more than once
2. The newly enacted laws and regulations or the revision of current laws and regulations make this pre-qualification system ineffective
3. By the reason of bid rigging or sanction by registered manufactures, etc, KOGAS is in a disadvantageous position in purchasing ME from registered manufactures
4. Acts of God or other Force Majeure makes it impossible for KOGAS to keep this prequalification system going.

Article 7 Applicable laws and Regulations

The precedence of the laws & regulations applying to bidding procedures and subsequent contract with RMs are given as listed below.

1. KOGAS Guidance for prequalification of the ME
2. This Notice
3. Invitation to Bid for the each ME
4. The Contract Regulations of KOGAS
5. International Trade Customs

Date :

Company Name :

Representative Name & Signature :

II. 경영상태평가 제출서류

1. 국외업체 : (주)나이스디앤비에서 발행한 D&B사의 Business Information Report
(영문 및 국문보고서)

- 신청방법 : <http://global.nicednb.com/gse/combine/> 에서 접속

※ 신청문의 : (주)나이스디앤비 허보람 대리(02-2122-2317, nathan@nicednb.com)

2. 국내업체 : (주)나이스디앤비에서 발행한 D&B사의 Business Information Report(영문 및 국문보고서) 또는 신용정보의이용및보호에관한법률 제4조 제1항 제1호 또는 제4호의 업무를 영위하는 신용정보업자가 발행한 공공기관 제출용 신용평가등급 확인서 (신용평가등급, 등급평가일 및 등급유효기간 등 명시)

※ 2010.12월 이후 신용정보업자는 나이스디앤비, 나이스신용평가정보, 서울신용평가정보, 이크레더블, 한국기업데이터 5개 기관임

3. 경영상태평가 부서

평가부서	평가자	전화번호	E-MAIL
자재계약팀	차장 강달훈	031-710-0419	dhk@kogas.or.kr

II. Business Information Report(orginal)

1. Foreign Manufacturer

- Business Information Report (in English and Korean) of DUN & BRADSTREET that issued Nice D&B Co.,Ltd.
- Method of Application : <http://global.nicednb.com/gse/combine/>
- ※ Inquiry Contact : boram Heo (02-2122-2317, nathan@nicednb.com)

2. Domestic Manufacturer

- Business Information Report (in English and Korean) of DUN & BRADSTREET that issued Nice D&B Co.,Ltd. or Credit Rating Confirmation Report for the public institutions must be issued by credit information collection agency under the law "USE AND PROTECTION OF CREDIT INFORMATION ACT Article 4 (1) 1 or 4" and the report must include the credit rating, the date of assessment and validity)

3. Evaluation Department

Evaluation Department	Person In Charge	Telephone	E-MAIL
Inventory & Contract Team	Kang, Dalhoon	031-710-0419	dhk@kogas.or.kr

Ⅲ. 기술능력평가 제출서류

1. 제작사양서

품 목	규 격	사용 구분	관리 번호
1. 밸브류			
- 천연가스용 볼밸브	· 4" 이하	생산용	1-1-1-A
	· 6" 이상(Top Entry only)	생산용	1-1-2-A
	· 4" 이하	공급용	1-1-1-B
	· 6" ~ 8"까지	공급용	1-1-2-B
	· 10" 이상	공급용	1-1-3
	· 매몰형	공급용	1-1-4
- 초저온 게이트밸브	· 2" 이하	생산용	1-2-1
	· 3" 이상	생산용	1-2-2
- 초저온 버터플라이밸브	· 버터플라이밸브	생산용	1-3-1
- 초저온 글로브밸브	· 콘트롤밸브 #300 이하	생산용	1-4-1
	· 콘트롤밸브 #300 초과	생산용	1-4-1
	· 수동밸브 2" 이하	생산용	1-4-2
	· 수동밸브 3" 이상	생산용	1-4-3
- 초저온 체크밸브	· Lift type	생산용	1-5-1
	· Swing type	생산용	1-5-2
	· Dual plate type	생산용	1-5-3
- 초저온 볼밸브	· 2" 이하	생산용	1-6-1
	· 3" 이상	생산용	1-6-2
- 안전밸브	· 초저온용(미압용)	생산용	1-7-1
	· 초저온용(고압용)	생산용	1-7-2
	· 천연가스용	공급용	1-7-3

품 목	규 격	사용 구분	관리 번호
2. 절연조인트	· 4" 이하 · 6" 이상	공통 공통	2-1-1 2-1-2
3. 계량설비	· 오리피스식 · 터빈미터식 · 초음파식	공통 공급용 공통	3-1-1 3-1-2 3-1-3
4. 가스누출경보기	· 열선형반도체식 · 접촉연소식	공통 공통	4-1-1 4-1-2
5. 통제설비	· SCAD식(RTU) · ICSS(DCS & ESDS)	공급용 생산용	5-1-1 5-1-2
6. 정압설비	· 4" 이하(Pilot controlled gas pressure regulator) · 6" 이상(Pilot controlled gas pressure regulator)	공급용 공급용	6-1-1 6-1-2
7. 무정전 전원장치	· 3Φ[All IGBT 방식] · 3Φ parallel type[All IGBT 방식(Isolated 방식제외)]	공급용 생산용	7-1-1 7-1-2
8. 방폭형등기구	· 1Φ 220V(방전등) · 1Φ 220V(LED등)	공통 공통	8-1-1 8-1-2

III. Documents for evaluation of technical capability

1. Manufacturing Specification

Item	Size	Purpose	NO.
1. Valves			
- Ball valve for natural gas	• up to 4 "	L.T	1-1-1-A
	• 6 " and over (Top Entry only)	L.T	1-1-2-A
	• up to 4 "	PIPE	1-1-1-B
	• 6" up to 8 "	PIPE	1-1-2-B
	• 10" and over	PIPE	1-1-3
	• Buried type Valve	PIPE	1-1-4
- Cryogenic Gate Valve	• up to 2 "	L.T	1-2-1
	• 3" and over	L.T	1-2-2
- Cryogenic Butterfly Valve	• Cryogenic Butterfly Valve	L.T	1-3-1
- Cryogenic Globe Valve	• Control Valve up to #300	L.T	1-4-1
	• Control Valve over #300	L.T	1-4-1
	• Manual Globe Valve up to 2"	L.T	1-4-2
	• Manual Globe Valve over 3"	L.T	1-4-3
- Cryogenic Check Valve	• Lift type	L.T	1-5-1
	• Swing Type	L.T	1-5-2
	• Dual plate type	L.T	1-5-3
- Cryogenic Ball Valve	• up to 2 "	L.T	1-6-1
	• 3" and over	L.T	1-6-2
- Safety Valve	• Cryogenic Valve		
	- low pressure	L.T	1-7-1
	- high pressure	L.T	1-7-2
	• Natural Gas Valve	PIPE	1-7-3

※ "BOTH" of Classification is used both LNG Terminal and Pipelines

L.T (LNG Terminals), PIPE (Pipelines), BOTH (LNG Terminals and Pipelines)

Item	Size	Purpose	NO.
2. Insulation Joint	• up to 4 "	BOTH	2-1-1
	• 6 " and over	BOTH	2-1-2
3. Metering System	• Orifice Type	BOTH	3-1-1
	• Turbine Type	PIPE	3-1-2
	• Ultrasonic Type	BOTH	3-1-3
4. Gas Leak Detection & Alarm System	• Catalytic Semiconductor Combination Type	BOTH	4-1-1
	• Catalytic Combustion Type	BOTH	4-1-2
5. Control system	• SCADA(RTU)	PIPE	5-1-1
	• ICSS(DCS & ESDS)	L.T	5-1-2
6. Pressure regulation Unit	• up to 4 " (Pilot controlled gas pressure regulator)	PIPE	6-1-1
	• 6 " and over (Pilot controlled gas pressure regulator)	PIPE	6-1-2
7. UPS	• 3Φ All IGBT type	PIPE	7-1-1
	• 3Φ Parallel[All IGBT Type (but except isolated type)]	L.T	7-1-2
8. Light Fixture (Explosion proof)	• 1Φ 220V (discharge lamp)	BOTH	8-1-1
	• 1Φ 220V (LED Lamp)	BOTH	8-1-2

※ "BOTH" of Classification is used both LNG Terminal and Pipelines
L.T (LNG Terminals), PIPE (Pipelines), BOTH (LNG Terminals and Pipelines)

1-1-1-A Ball valve for natural gas [For LNG terminals, up to 4"]

A. Ball valve Submittal

ITEMS	Remark
1) Certification (ISO 9001, API 6D, Fire Safe, Sealing Material and other) * Fire Safe : All Size	
2) Manufacture Brochure	
3) Manufacture & Inspection equipment List	
4) Assembly Drawing for All Sizes(Including Dimensions, Material Part List, Weight, Gear Box Specification)	
5) Design Calculation Sheets <ul style="list-style-type: none"> - Body, Closure, Stem Strength - Bolt Strength - Seat Spring Strength - Gear Ratio 	
6) Procurement Specification of Main Components <ul style="list-style-type: none"> - Sealing Material (FKM/FPM), Gasket (Graphite, etc) - Plating Specification (Zn, ENP, Cr ect) - Bearing, Bolt & Nut, Spring, Gear and so on 	
7) Manufacturing Procedure	
8) Manufacturer's Test or Inspection Procedure <ul style="list-style-type: none"> - Shell Hydrostatic Test - Seat Test <ul style="list-style-type: none"> . High Pressure Test . Low Pressure Test - Operation Test For Valve Hand wheel and Lever - Visual Inspection - External tightness Test 	
9) Heat Treatment Specification	
10) O-ring, Gasket, Graphite Specification	
11) Gear Box Detail Drawing	
12) Plating (ENP or Cr) Specification	

ITEMS	Remark
13) Painting Specification	
14) Spare Part List	
15) QA, QC Manual	
16) Sub-supplier List	
17) Supply record	

B. Actuator Submittal

Experience list combined with 3 major actuator manufacturer.
(BIFFI, ROTORK, LIMITOQUE)

- 1-1-2-A Ball valve for natural gas [For LNG terminasl, 6" and over (Top Entry only)]

A. Ball valve Submittal

ITEMS	Remark
1) Certification (ISO 9001, API 6D, Fire Safe, Sealing Material and other) * Fire Safe : All Size	
2) Manufacture Brochure	
3) Manufacture & Inspection equipment List	
4) Assembly Drawing for All Sizes(Including Dimensions, Material Part List, Weight, Gear Box Specification)	
5) Design Calculation Sheets <ul style="list-style-type: none"> - Body, Closure, Stem Strength - Bolt Strength - Seat Spring Strength - Gear Ratio 	
6) Procurement Specification of Main Components <ul style="list-style-type: none"> - Sealing Material (FKM/FPM), Gasket (Graphite, etc) - Plating Specification (Zn, ENP, Cr ect) - Bearing, Bolt & Nut, Spring, Gear and so on 	
7) Manufacturing Procedure	
8) Manufacturer's Test or Inspection Procedure <ul style="list-style-type: none"> - Shell Hydrostatic Test - Seat Test <ul style="list-style-type: none"> . High Pressure Test . Low Pressure Test - Operation Test For Valve Hand wheel and Lever - Visual Inspection - External tightness Test 	
9) Heat Treatment Specification	
10) O-ring, Gasket, Graphite Specification	
11) Gear Box Detail Drawing	
12) Plating (ENP or Cr) Specification	

ITEMS	Remark
13) Painting Specification	
14) Spare Part List	
15) QA, QC Manual	
16) Sub-supplier List	
17) Supply record	

B. Actuator Submittal

Experience list combined with 3 major actuator manufacturer.
(BIFFI, ROTORK, LIMITOQUE)

○ 1-1-1-B, 1-1-2-B, 1-1-3, 1-1-4

Ball valve for natural gas [For Pipelines, up to 4", 6" up to 8, Over 10", Buried type Valve]

A. Ball valve Submittal

ITEMS	Remark
1) Certification (ISO 9001, API 6D, Fire Safe, Sealing Material and other) * Fire Safe : All Size	
2) Manufacture Brochure	
3) Manufacture & Inspection equipment List	
4) Assembly Drawing for All Sizes(Including Dimensions, Material Part List, Weight, Gear Box Specification)	
5) Design Calculation Sheets - Body, Closure, Stem Strength - Bolt Strength - Seat Spring Strength - Gear Ratio	
6) Procurement Specification of Main Components - Sealing Material (FKM/FPM), Gasket (Graphite, etc) - Plating Specification (Zn, ENP, Cr ect) - Bearing, Bolt & Nut, Spring, Gear and so on	
7) Manufacturing Procedure	
8) Manufacturer's Test or Inspection Procedure - Shell Hydrostatic Test - Seat Test . High Pressure Test . Low Pressure Test - Operation Test For Valve Hand wheel and Lever - Visual Inspection - External tightness Test	
9) Heat Treatment Specification	
10) O-ring, Gasket, Graphite Specification	
11) Gear Box Detail Drawing	
12) Plating (ENP or Cr) Specification	

ITEMS	Remark
13) Painting Specification	
14) Spare Part List	
15) QA, QC Manual	
16) Sub-supplier List	
17) Supply record	

B. Actuator Submittal

Experience list combined with 3 major actuator manufacturer.
(BIEFFI, ROTORK, LIMITOQUE)

○ 1-2-1 ~ 2 Cryogenic Gate Valve [For LNG Terminals, up to 2", over 3"]

Items	Manufacturer	Remarks		
		Good	Acceptable	Not acceptable
○ Certificates - ISO 9001 or 9002 - Fire safe test - Others				
○ Catalogue cuts				
○ Assembly Drawings for all sizes - Dimensions, materials and weight specified				
○ Manufacturing spec. & procedure				
○ Strength calculation sheet for body and other parts				
○ WPS & PQR				
○ Test and Inspection procedure				
○ QA/QC manual				
○ Characteristic diagram & open-closing torque				
○ Painting specification				
○ Packing and transportation specification				
○ Heat treatment specification				
○ Repair specification				
○ Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)				
○ Sub-supplier list				
○ Documents related Motor or pneumatic actuator - Vendor catalogues - Drawing, Data sheet, Calculation sheet - Wiring diagrams - Test and Inspection procedure - Explosion proof test certificates - Performance curve and data - Others				
○ Supply record - Body/Seat material - Design temp./pressure - Cryogenic test report				
○ Agent agreement, if necessary				

○ 1-3-1 Cryogenic Butterfly Valve [For LNG Terminals]

Items	Manufacturer	Remarks		
		Good	Acceptable	Not acceptable
○ Certificates - ISO 9001 or 9002 - Fire safe test - Others				
○ Catalogue cuts				
○ Assembly Drawings for all sizes - Dimensions, materials and weight specified				
○ Manufacturing spec. & procedure				
○ Strength calculation sheet for body and other parts				
○ WPS & PQR				
○ Test and Inspection procedure				
○ QA/QC manual				
○ Characteristic diagram & open-closing torque				
○ Painting specification				
○ Packing and transportation specification				
○ Heat treatment specification				
○ Repair specification				
○ Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)				
○ Sub-supplier list				
○ Documents related Motor or pneumatic actuator - Vendor catalogues - Drawing, Data sheet, Calculation sheet - Wiring diagrams - Test and Inspection procedure - Explosion proof test certificates - Performance curve and data - Others				
○ Reference list - Body/Seat material - Design temp./pressure - Cryogenic test report				
○ Agent agreement, if necessary				

○ 1-4-1 Cryogenic Globe Valve [For LNG Terminals, Control Valve up to 300#, over 300#]

Items	section	page
○ Certificates - ISO 9001 or 9002 - Others		
○ Catalogue cuts(color)		
○ Assembly Drawings for all sizes - Dimensions, materials and weight specified		
○ Manufacturing spec. & procedure		
○ Test and Inspection procedure including cryogenic test procedure		
○ QA/QC manual		
○ Packing and transportation specification		
○ Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)		
○ Sub-supplier list		
○ Documents related to actuator - Vendor catalogues - Drawing, Data sheet, Calculation sheet - schematic diagrams - Test and Inspection procedure - Explosion proof test certificates - Performance curve and data - Others		
○ Supply record - Including more than 6"x 900# - Cryogenic test report - Data sheet for all supply list		
○ Agent agreement, if necessary		

○ 1-4-2~3 Cryogenic Globe Valve [For LNG Terminals, Manual Globe Valve up to 2", 3" and over]

Items	Manufacturer	Remarks		
		Good	Acceptable	Not acceptable
○ Certificates - ISO 9001 or 9002 - Fire safe test - Others				
○ Catalogue cuts				
○ Assembly Drawings for all sizes - Dimensions, materials and weight specified				
○ Manufacturing spec. & procedure				
○ Strength calculation sheet for body and other parts				
○ WPS & PQR				
○ Test and Inspection procedure				
○ QA/QC manual				
○ Characteristic diagram & open-closing torque				
○ Painting specification				
○ Packing and transportation specification				
○ Heat treatment specification				
○ Repair specification				
○ Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)				
○ Sub-supplier list				
○ Documents related Motor or pneumatic actuator - Vendor catalogues - Drawing, Data sheet, Calculation sheet - Wiring diagrams - Test and Inspection procedure - Explosion proof test certificates - Performance curve and data - Others				
○ Supply record - Body/Seat material - Design temp./pressure - Cryogenic test report				
○ Agent agreement, if necessary				

○ 1-5-1~3 Cryogenic Check Valve [For LNG Terminals, LIFT, SWING, DUAL PLATE TYPE]

Items	Manufacturer	Remarks		
		Good	Acceptable	Not acceptable
○ Certificates - ISO 9001 or 9002 - Fire safe test - Others				
○ Catalogue cuts				
○ Assembly Drawings for all sizes - Dimensions, materials and weight specified				
○ Manufacturing spec. & procedure				
○ Strength calculation sheet for body and other parts				
○ WPS & PQR				
○ Test and Inspection procedure				
○ QA/QC manual				
○ Characteristic diagram & open-closing torque				
○ Painting specification				
○ Packing and transportation specification				
○ Heat treatment specification				
○ Repair specification				
○ Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)				
○ Sub-supplier list				
○ Supply record - Body/Seat material - Design temp./pressure - Cryogenic test report				
○ Agent agreement, if necessary				

○ 1-6-1~2 Cryogenic Ball Valve [For LNG Terminals, up to 2", 3" and over]

Items	Manufacturer	Remarks		
		Good	Acceptable	Not acceptable
○ Certificates - ISO 9001 or 9002 - Fire safe test - Others				
○ Catalogue cuts				
○ Assembly Drawings for all sizes - Dimensions, materials and weight specified				
○ Manufacturing spec. & procedure				
○ Strength calculation sheet for body and other parts				
○ WPS & PQR				
○ Test and Inspection procedure				
○ QA/QC manual				
○ Characteristic diagram & open-closing torque				
○ Painting specification				
○ Packing and transportation specification				
○ Heat treatment specification				
○ Repair specification				
○ Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)				
○ Sub-supplier list				
○ Documents related Motor or pneumatic actuator - Vendor catalogues - Drawing, Data sheet, Calculation sheet - Wiring diagrams - Test and Inspection procedure - Explosion proof test certificates - Performance curve and data - Others				
○ Supply record - Body/Seat material - Design temp./pressure - Cryogenic test report				
○ Agent agreement, if necessary				

1-7-1 Safety Valve [For LNG Terminals, Cryogenic low pressure Valve]

NO.	Drawings And Data Required	Section	Page
1	Manufacturing Schedule(Each Type)		
2	Certificates - ISO 9001 or 9002 - Others		
3	Catalogue cuts(color of each type))		
4	Assembly Drawings for all sizes(Each Type) - Dimensions, materials and weight specified		
5	Manufacturing Specification & procedure(Each Type)		
6	Operating Principle(Each Type)		
7	Test and Inspection procedure including cryogenic test procedure(Each Type)		
8	Quality Control/Quality Assurance Program		
9	Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)		
10	Safety valve Sizing Calculation Sheet And Detailed Performance Curves / Data, Valve Selection Chart(Each Type)		
11	Code Compliance Certificates		
12	Operation & Maintenance Manual(Each Type) (Including Installation/ Disassembly Procedure)		
13	Supply record(Each Type) (including More Than pilot(10"x12")/Vacuum relief(8")) - Data sheet for all supply list - LNG storage tank(below 15psi) - LNG ship(below 15psi)		
14	Agent agreement, if necessary		

* Each Type means Pilot Type/vacuum relief type

○ 1-7-2 Safety Valve [For LNG Terminals, Cryogenic high pressure Valve]

NO.	Drawings And Data Required	Section	Page
1	Manufacturing Schedule(Each Type)		
2	Certificates - ISO 9001 or 9002 - Others		
3	Catalogue cuts(color of each type))		
4	Assembly Drawings for all sizes(Each Type) - Dimensions, materials and weight specified		
5	Manufacturing Specification & procedure(Each Type)		
6	Operating Principle(Each Type)		
7	Test and Inspection procedureincluding cryogenic test procedure (Each Type)		
8	Quality Control/Quality Assurance Program		
9	Foundry, manufacturing and test facilities including cryogenic test bench (with Photograph)		
10	Safety valve Sizing Calculation Sheet And Detailed Performance Curves / Data, Valve Selection Chart(Each Type)		
11	Code Compliance Certificates		
12	Operation & Maintenance Manual(Each Type) (Including Installation/ Disassembly Procedure)		
13	Supply record(Each Type) - including more than 4"x6"& #900 - Cryogenic test report - Data sheet for all supply list		
14	Agent agreement, if necessary		

* Each Type means Pilot Type/Conventional Type

○ 1-7-3 Safety Valve [For Pipelines, Natural Gas Valve]

I T E M S	MANUFACTURE SPEC.	REMARKS
1. Dwg & Data Submittal List / Schematic		
2. Specification		
3. Dimensional Outline Drawings With Material		
4. Manufacturer Brochure		
5. Design Calculation Sheet - Orifice Area Calculation - Spring Calculation		
6. Code Compliance Certificate (API 520, 526, 527)		
7. QA/QC Manual		
8. Supply record		
9. Manufacturing Spec.		

○ 2-1-1~2 Insulation Joint [For both, up to 4", 6" and over]

I T E M S	MANUFACTURE SPEC.	Remark
1. Manufactureing Spec. And Procedure		
2. Drawings - Material, Dimension And Weights Specified		
3. QA/QC Manual(Includ Inspection Equipment List)		
4. Welding And Test Spec. - WPS, PQR - Hydraulic, Pneumatic Test - N.D.T - Insulation Test - Cold-resistance Test - Heat Resistance Test - Gas Resistance Test - Tensile Test - Bending Test		
5. Heat Treatment Spec.		
6. Strength Calcusation Sheet For Internal Pressure		

○ 3-1-1 Metering System [Common, Orifice Type]

Item	Section	Page
1. Manufacturing specification for all equipment including gas chromatograph		
2. Orifice meter run drawing		
3. Software description		
4. Uncertainty calculation sheet		
5. Instrument data sheet & specification		
6. System block diagram		
7. Interconnection diagram		
8. Flowrate calculation procedure		
9. QA/QC Manual		
10. Operation and maintenance manual		
11. Catalog and other relative material		

○ 3-1-2 Metering System [For Pipelines, Turbine Type]

Item	Section	Page
1. Manufacturing specification for all equipment		
2. Flow meter assembly drawing		
3. Software description		
4. Uncertainty calculation sheet		
5. Instrument data sheet & specification		
6. System block diagram		
7. Interconnection diagram		
8. Flowrate calculation procedure		
9. QA/QC Manual		
10. Operation and maintenance manual		
11. Catalog and other relative material		

○ 3-1-3 Metering System [Common, Ultrasonic Type]

Items	Section	Page
1. Manufacturing specification for all equipment (including gas chromatograph)		
2. System block diagram including signal description		
3. Meter sizing program and sizing results per 1,000Nm ³		
4. Flow Computer panel drawing including wiring diagram		
5. Log format and CRT display format		
6. Assembly drawing of Ultra sonic meter		
7. Interconnection diagram		
8. Software description		
9. Uncertainty calculation sheet		
10. Interface specification with other equipment (instrument, RTU, MOV panel, gas chromatograph)		
11. Hook-up drawing of transmitter and gas chromatograph (including list of equipment in these cabinet)		
12. Gas chromatograph cabinet specification including the following data as a minimum <ul style="list-style-type: none"> - Loading data - Cabinet dimension and drawing - Assembly drawing 		
13. Ladder diagram or logic diagram of PLC		
14. Instrument data sheet		
15. Flowrate calculation procedure		
16. Detail description of operation principle for all systems		
17. QA/QC Manual		
18. Perturbation pattern approval certificate (upstream and downstream)		
19. Required test certificates issued by authorized agency <ul style="list-style-type: none"> - Transmitter(calibration and explosion proof), - Temp. element(calibration), - Gas chromatograph(explosion proof, accuracy) 		
20. Operation and maintenance manual		
21. Catalog and other relative material		

○ 41-1 Gas Leak Detection & Alarm System

[Common, Catalytic Semiconductor Combination Type]

Item	Section	Page
1. Manufacturing Schedule		
2. Bill Of Material(Including Catalog)		
3. System Description		
4. Monitoring Panel Arrangement Drawing (Including Interior Parts List)		
5. Specification Of Alarm Unit, Indicator Unit, Sensor. (Including Environmental Condition, Detection Range(LEL), Detection Accuracy At Alarm Of 5%LEL & 10%LEL Gas Concentration, Alarm Stage, Alarm Setting Point(LEL), Sensing Time)		
6. Wiring Drawing For Cable Connection		
7. System Block Diagram		
8. Inspection And Test Procedure		
9. Inspection And Test Report		
10. Certificates Of Model Approved By Korea Fire Equipment Inspection Corp.(Including Ambient Temperature)		
11. Certificates Of Explosion Proof Approved By KOSHA Or KGS Or KTL		
12. Operation & Maintenance Manual		
13. Quality Assurance And Quality Control Program		

○ 4-1-2 Gas Leak Detection & Alarm System [Common, Catalytic Combustion Type]

No.	Data required	Section	Pages
1	Hardware design specification <ul style="list-style-type: none"> - Detector sensor w/Transmitter - Indicating /alarm module - Monitoring panel - Internal wiring diagram 		
2	Interconnection diagram		
3	Outline drawing including main dimensions, arrangement and weight		
4	Manufacturing schedule		
5	QA/QC manual		
6	Factory test and inspection procedure		
7	Operation & maintenance manual		
8	Certificates (explosion proof) approved by KOSHA or KGS or Others		
9	Catalog for all equipment		
10	its own products for sensor		
11	Reference list (catalytic combustion type) <ul style="list-style-type: none"> - Detector sensor w/Transmitter(local indicating type) - Indicating /alarm module - Monitoring panel 		
12	<ul style="list-style-type: none"> ○ Domestic product <ul style="list-style-type: none"> - product approval and Inspection report of Application Products ○ Imported products <ul style="list-style-type: none"> - authorized product approval equivalent in type approval in their own country or in any region(ex. EU), or product approval and Inspection report of application products - Type approval of gas leak alarm according to laws involved in firefighting, authorized technical standards. and standard, comparison of results of the inspection report of relevant imported products - If necessary, KOGAS will perform Temperature test, humidity test and detection accuracy during a site inspection according to the KOGAS Technical Standards 		
13	Agent agreement, if necessary		

○ 5-1-1 Control System [For Pipelines, SCADA (RTU)]

No.	Document requirement	Section	Pages
1	System configuration diagram & explanation		
2	Tabulation of unit/device(BOM) - All of devices including maker		
3	System software list & explanation - All of softwares including maker, version & license - The purpose and detailed function of each software		
4	Detailed Functional design document - Redundant 2 power module system - Redundant 2 cpu module system - AI/DI/DO module and their subsidiary devices - Data transmission and control between modules		
5	System layout drawing and interconnection diagram		
6	RTU communication scheme & explanation - Detailed internal and external communication method		
7	Wiring diagram - Power supply diagram to all module and device - All signal communications internally and externally		
8	Diagnostics, affordable AI/DI/DO point and communication port number, affordable kinds of points and communication with protocol		
9	All of alarms and events from RTU to SCADA and MMI		
10	Detailed PLC spec for controlling field equipment		
11	Detailed MMI spec for controlling RTU		
12	Operating & maintenance manual about proposal model - Exchange period of all modules and devices - Detailed operation and maintenance procedure - Maintenance tools and software - Trouble shooting and experience in other site - Company's A/S strategy		
13	Official catalog about proposal model in hard copy		
14	Detailed circuit drawing of all modules and devices		
15	All certification and inspection report about proposal model - EMI certification - Surge protection from outer power, signal, communication - All evidence for estimating company's technical level		
16	Pictures of all modules in front, side, up and down view including major devices position		
17	RTU panel structure drawing including modules position in front, rear, side view		
18	Service history : The number of his customer using the system hardware and the type of application and the bidder shall state the formal announcement date of each proposed new product and the expected life.		

○ 5-1-2 Control System [For LNG Terminals, ICSS(DCS, ESDS)]

No.	Items	Section	Pages
1	For the logic solver (including all components) - Safety manual certified by TUV		
2	Company experience for DCS and ESD System Installed in the LNG receiving terminal or Natural Gas liquefaction plant within recently 5 years		
3	Field proven- SIS system(based on PLC) and DCS		
4	Personnel competence for SIS system a) experience evidence (end user's signature) b) qualification certificate(functional safety engineer, functional safety expert) c) training certificate from training institute such as TUV or equivalent		
5	For the logic solver certificates by TUV in compliance with IEC 61508 a) central processor unit(SIL 3) b) I/O module(SIL 3) c) internal communication components (SIL 3)		
6	Project schedule by activity list, duration and WBS- detail engineering schedule for both basic study items and detail engineering items and system testing after award		
7	Each system functional description for DCS, ESD		
8	Hardware system specifications w/model no. And manufacture's name for OWS, Controller, EWS, IO module etc		
9	QA/QC manual		
10	Software specifications w/model no. And manufacture's name		
11	Operation & maintenance manual		
12	Communication method and hardware configuration between all systems (PIS, ESD, F&G, FDS, OTS, large display system, IT-V system, Voice Announcement System, Thirty party interface etc)		
13	Reliability data (MTBF) for each system components with calculation sheet		

* SIS means ESD system

No.	Items	Section	Pages
14	Detail explanation for how to expand control system including maximum quantities of system		
15	Environmental control requirements such as temperature and humidity control ranges and quality of air filtration		
16	State In/Out Signal route required between control system and local instrument		
17	System Architecture : a) Voting : 1oo2D or 2oo4D(Redundancy Loop) b) Simplex Mode :Single Input-Single CPU-Single Output Modules Shall be Sufficient To Provide The Required SIL3 c) Fault Tolerance :		
18	Application Software list for DCS, SIS(ESD)		
19	the policy of License price per point or user's DCS/ ESD, EWS		
20	All controller main processors and input/outputs processors as "conformally" coated against airborne contaminants		
21	On Line Function		
22	Training policy -Devices, ROOM, Language		
23	The functional specification to certify the reliability of communication system - Method of communication (polling, interrupt etc.) - Transmission speed of network - Method of error detection - Buffer capacities of device interfaces - Maximum number of nodes/stations permitted on communications bus - Maximum length of communications bus permitted		
NOTICE : Including Hard-copy, DVD 2 Copy is Required			

○ 6-1-1~2 Pressure regulation Unit [For Pipelines, up to, 4", 6" and over(Pilot controlled gas pressure regulator)]

NO.	Submittal Documents & Drawings	REMARK
1	System assembly drawing (including all components)	
2	Catalog & Data sheet for each component (including material specification, dimension)	
3	Main Component Manual (Operation / Maintenance / Installation) <ul style="list-style-type: none"> - The monitor regulator - The worker regulator - Silencer - Slam shut valve - Pilot - Secondary pressure stabilizing barrel - Position transmitter, Switch & Pressure gauge - Heat tracing equipment - Accessories 	
4	Capacity and noise calculation sheet for each regulator size at maximum and minimum flow rate	
5	Table of delivery time (Including manufacturing, assembling, delivery) per Regulator size <ul style="list-style-type: none"> - Delivery method : DDU, FOB 	
6	Pilot information	
7	All kinds of certificates or approvals issued by An authorized agency including 'fail-to-open' and 'fail-to-close'	
8	Inspection and test procedure <ul style="list-style-type: none"> ○ Inspection procedure <ul style="list-style-type: none"> - Material inspection - Non-destructive test - Dimensional check - Visual inspection - Inspection of heat treatment - Painting inspection ○ Test procedure <ul style="list-style-type: none"> - Hydrostatic test - External leakage test - Internal leakage test - Acoustic absorptivity test - Performance test[for AC, SG, SZ] 	

○ 7-1-1 UPS [For Pipelines, 3Φ All IGBT 방식]

번호	제출서류	구분	페이지
1	제작규격서(적용 코드 및 표준 포함)		
2	BILL OF MATERIAL (카타로그 포함)		
3	제작공정표		
4	UPS SYSTEM 계통설명서		
5	UPS SYSTEM POWER CONFIGURATION DIAGRAM		
6	UPS CONTROL SIGNAL CONFIGURATION DIAGRAM		
7	UPS SYSTEM 3선도(변압기 결선도 포함)		
8	단상, 삼상 UPS 용량 계산서(축전지 용량계산서 포함)		
9	PANEL ARRANGEMENT DWG.		
10	정류부, 인버터(단상, 삼상), AVR 제어방식 및 주소자 세부사양		
11	UPS 성능보장을 위한 관련자료 및 참고 도서 (뇌씨지 보호 대책 포함)		
12	QA/QC MANUAL(AFTER SERVICE 및 시험 절차서 포함)		
13	각종 시험성적서(뇌씨지, 전압 안정도, 과부하 내량, 충전전압 맥 동률, 전류제한, 출력 주파수 안정도, 소음(전방1.5M), 동기절체시 간, 응답속도, 출력파형 왜율, 용량별 효율, 출력변압기 절연 CLASS 포함)		
14	성능시험 계획서 및 검사 절차서		
15	운전 및 보수 MANUAL		
16	UPS 용량 제작실적		

○ 7-1-2 UPS [For LNG terminals, 3Φ Parallel type [All IGBT 방식(Isolated 방식제외)]]

NO.	Items	Section	Page
1	제작규격서(적용 코드 및 표준 포함)		
2	BILL OF MATERIAL (카타로그 포함)		
3	제작공정표		
4	UPS SYSTEM 계통설명서		
5	UPS SYSTEM POWER CONFIGURATION DIAGRAM		
6	UPS CONTROL SIGNAL CONFIGURATION DIAGRAM		
7	UPS SYSTEM 3선도(변압기 결선도 포함)		
8	단상, 삼상 UPS 용량 계산서(충전지 용량계산서 포함)		
9	PANEL ARRANGEMENT DWG.		
10	정류부, 인버터(단상, 삼상), AVR 제어방식 및 주소자 세부사양		
11	UPS 성능보장을 위한 관련자료 및 참고 도서 (뇌씨지 보호 대책 포함)		
12	QA/QC MANUAL(AFTER SERVICE 및 시험 절차서 포함)		
13	각종 시험성적서(뇌씨지, 전압 안정도, 과부하 내량, 충전전압 맥 동률, 전류제한, 출력 주파수 안정도, 소음(전방1.5M), 동기절체시 간, 응답속도, 출력파형 왜율, 용량별 효율, 출력변압기 절연 CLASS 포함)		
14	성능시험 계획서 및 검사 절차서		
15	운전 및 보수 MANUAL		
16	UPS 용량 제작실적		

○ 8-1-1. Light Fixture(Explosion proof) [Common, 1Φ 220V (discharge lamp)]

번호	제출서류	구분	페이지
1	제작상세도(부품 배치도 포함)		
2	기기 및 부속기기 사양서(강관주사양 포함)		
3	기기 및 부속기기 CATALOG		
4	부속기기 종류 및 수량		
5	시험 및 검사 계획서		
6	각종 시험성적서(방폭인증서 및 IP CLASS 포함)		
7	품질관리 계획서		
8	성능시험 계획서 및 검사 절차서		

○ 8-1-2. Light Fixture(Explosion proof) [For both, 1Φ 220V (LED Lamp)]

NO.	Items	Section	Page
1	제작상세도(부품 배치도 포함)		
2	기기 및 부속기기 사양서(강관주사양 포함)		
3	기기 및 부속기기 CATALOG		
4	부속기기 종류 및 수량		
5	시험 및 검사 계획서		
6	각종 시험성적서(방폭인증서 및 IP CLASS 포함)		
7	품질관리 계획서		
8	성능시험 계획서 및 검사 절차서		

2. 납품실적 제출서류(공고일 기준 최근 5년간)

☐ 당해물품 납품실적 제출시 유의사항

- 납품실적은 상기 양식에 따라 작성하여야 하며, 납품처의 실적증명서, 송장 및 발주처의 승인 도면(발주처 연락처 포함)을 제출하여야 함(계약서와 송장을 동시에 제출하는 경우 실적증명서 대체 가능)
- 제출된 납품실적중에서 제작방식, 사용조건, 형식, 사용처 등에 따라 일부 실적 불인정 될 수 있음
- 납품실적은 우리공사 및 타사에 납품한 실적 모두 가능함
- 납품실적이 허위로 판명되는 경우 평가대상에서 제외 및 등록취소
- 일부 항목 누락 또는 불명시된 경우에는 해당실적 불인정될 수 있음

2. Reference list (For the last 5 years from announcement)

☐ Precautions to submit document

- Reference list shall be made in accordance with the above form, and shall submit a certificate of vendor, invoice and approved drawing by vender (with contact information of vender) (the certificate of vendor can be replaced by submitting the contract and invoice together)
- Among the submitted reference list, some of them may not be accepted depending on the production methods, condition of use, type, use ranges and so on
- Both the reference list of KOGAS and other companies are accepted as a reference list
- If the submitted document turns out to be false, the application will be excluded from evaluation and qualification will be canceled
- If some of the documents are missing or unspecified, the relevant document may not be accepted

☐ Supply record

1-1-1-A Ball valve for natural gas [up to 4"] (For the last 5 years)

[illegible][illegible]

1-1-2-A Ball valve for natural gas [6" and over (Top Entry Only)] (For the last 5 years)

[illegible]

※ TOP ENTRY 방식

[illegible]

※ TOP ENTRY type

1-1-1-B, 1-1-2-B, 1-1-3~4 Ball valve for Pipeline

[up to 4", 6" up to 8", Over 10", Buried type Valve] (For the last 5 years)

[illegible][illegible]

1-2-1~2 Cryogenic Gate Valve [up to 2", over 3"] (For the last 5 years)

[illegible][illegible]

1-3-1 Cryogenic Butterfly Valve (For the last 5 years)

[illegible][illegible]

1-4-1 Cryogenic Globe Valve[Control up to #300, over #300 Valve] (For the last 5 years)

[illegible][illegible]

1-4-2~3 Cryogenic Globe Valve [Manual Globe Valve up to 2", over 3"] (For the last 5 years)

[illegible][illegible]

1-5-1 ~ 3 Cryogenic Check Valve[LIFT, SWING, DUAL PLATE TYPE] (For the last 5 years)

[illegible][illegible]

1-6-1~2 Cryogenic Ball Valve [up to 2", over 3"] (For the last 5 years)

[illegible][illegible]

[illegible]

1-7-2 Safety Valve [Cryogenic high pressure Valve] (For the last 5 years)

[illegible][illegible][illegible]

2-1-1~2 Insulation Joint [up to 4", 6" and over] (For the last 5 years)

품목	규격 (SIZE×압력등급)	단위 (EA)	수량	납품처	납품일자	사용처 (사용조건)	공급방식 (자가상표, OEM,ODM)	비고
합계								

ITEM	SIZE (SIZE×Pressure class)	unit (EA)	amount	vendor	date	use (condition)	manufac ture (own brand, OEM,ODM)	note
total								

3-1-1~2 Metering System [Orifice Type, Turbine Type (For the last 5 years)

품목	규격	단위 (식,열)	수량	납품처	납품일자	사용처 (사용조건)	공급방식 (자가상표, OEM,ODM)	비고
합계								

ITEM	SIZE (SIZE×Pressure class)	unit (set, line)	amount	vendor	date	use (condition)	manufac ture (own brand, OEM,ODM)	note
total								

3-1-3 Metering System [Ultrasonic Type] (For the last 5 years)

품목	규격	단위 (식,열)	수량	납품처	납품일자	사용처 (사용조건)	공급방식 (자가상표, OEM,ODM)	비고
합계								

ITEM	SIZE (SIZE×Pressure class)	unit (set, line)	amount	vendor	date	use (condition)	manufac ture (own brand, OEM,ODM)	note
total								

4-1-1 Gas Leak Detection & Alarm System [Catalytic Semiconductor Combination Type]
(For the last 5 years)

품목	규격 (열선형반도체식)	방폭형 센싱헤드	형식 (분리식)	수량 (SET)	END USER			납품처	납품 일자	사용처 (산업용)	공급방식 (자가상표, OEM,ODM)	비고
					회사명	담당자	e-mail& tel					
합 계												

*분리식: 센서와 경보기 분리형

ITEM	standard (Catalytic Semiconductor)	Explosion proof sensing head	type (separate)	amount (SET)	END USER			vendor	date	use (industry)	manufacture (own brand, OEM,ODM)	note
					company and addresses	person in charge	e-mail &TEL					
total												

*separate type : sensor is detached from alarm

4-1-2 Gas Leak Detection & Alarm System [Catalytic Combustion Type] (For the last 5 years)

품목	규격 (접촉연소식)	방폭형 센싱헤드 (지시계 및 전송기 형식)	형식 (분리식)	수량 (SET)	END USER			납품처	납품 일자	사용처 (산업용)	공급방식 (자가상표, OEM,ODM)	비고
					회사명	담당자	e-mail& tel					
합 계												

*분리식: 센서와 경보기 분리형

ITEM	standard(Cat alytic Combustion)	Explosion proof sensing head (indicating instrument and transmitter)	type (separate)	amount (SET)	END USER			vendor	date	use (industry)	manufacture (own brand, OEM,ODM)	note
					company and addresses	person in charge	e-mail &TEL					
total												

*separate type : sensor is detached from alarm

5-1-1 Control System [SCADA(RTU)] (For the last 5 years)

품목	규격	단위 (식)	수량	납품처	납품일자	사용처 (사용조건)	공급방식 (자가상표, OEM,ODM)	비고
합계								

ITEM	TYPE	UNIT (SET)	amount	vendor	date	use (condition)	manufac ture (own brand, OEM,ODM)	note
total								

5-1-2 Control System [ICSS (DCS, ESDS)] (For the last 5 years)

품목	규격	단위 (식)	수량	납품처	납품일자	사용처 (사용조건)	공급방식 (자가상표, OEM,ODM)	비고
합계								

ITEM	TYPE	UNIT (SET)	amount	vendor	date	use (condition)	manufac ture (own brand, OEM,ODM)	note
total								

6-1-1~2 Pressure regulation Unit [up to 4", 6" and over (Pilot controlled gas pressure regulator)] (For the last 5 years)

품목	규격 (SIZE×압력등급)	단위 (식,열)	수량	납품처	납품일자	사용처 (사용조건)	공급방식 (자가상표, OEM,ODM)	비고
합계								

ITEM	SIZE (SIZE×Pressure rating)	unit (set,line)	amount	vendor	date	use (condition)	manufac ture (own brand, OEM,ODM)	note
total								

7-1-1 UPS [3Φ All IGBT 방식] (For the last 5 years)

[illegible][illegible]

7-1-2 UPS [3Φ Parallel type [All IGBT 방식(Isolated 방식제외))] (For the last 5 years)

[illegible][illegible]

8-1-1 Light Fixture(Explosion proof) [1Φ 220V (discharge lamp)] (For the last 5 years)

[illegible][illegible]

8-1-2 Light Fixture(Explosion proof) [1Φ 220V (LED Lamp)] (For the last 5 years)

[illegible][illegible]

□ 품목별 납품실적 적격기준

품 목	규격	사용 구분	적격기준
1. 밸브류 - 가스용볼밸브	4"이하	공급	최근5년간 납품실적이 50EA이상이고 기간에 상관없이 4" #600 밸브 1개 이상 납품실적 보유
	6"~8"까지	공급	최근5년간 납품실적이 50EA이상이고 기간에 상관없이 8" #600 밸브 1개 이상 납품실적 보유
	10"이상	공급	최근5년간 납품실적이 300EA이상이고 기간에 상관없이 30" #600 밸브 1개 이상 납품실적 보유
	매몰형	공급	최근5년간 납품실적이 10EA이상이고 기간에 상관없이 30" #600 밸브 1개 이상 납품실적 보유
	4"이하	생산	최근5년간 납품실적이 100EA이상이고 기간에 상관없이 4" #900 밸브 1개 이상 납품실적 보유
	6"이상	생산	최근5년간 납품실적이 50EA이상이고 기간에 상관없이 30" #900밸브(Top Entry Type) 1개 이상 납품실적 보유
- 초저온 게이트밸브	2"이하	생산	최근5년간 납품실적이 50EA이상이고 기간에 상관없이 2" #900 밸브 1개 이상 납품실적 보유
	3"이상	생산	최근5년간 납품실적이 100EA이상이고 기간에 상관없이 24" #900 밸브 1개 이상 납품실적 보유
- 초저온 버터플라이	초저온버터플라이	생산	최근5년간 납품실적이 50EA이상이고 기간에 상관없이 36" #300 밸브 1개 이상 납품실적 보유
- 초저온 글로브밸브	콘트롤밸브 #300 이하	생산	최근5년간 납품실적이 #300 밸브 20EA 이상 납품실적 보유
	콘트롤밸브 #300 초과	생산	최근5년간 납품실적이 20EA이상이고 기간에 상관없이 6" #900 밸브 1개 이상 납품실적 보유
	수동 2"이하	생산	최근5년간 납품실적이 100EA이상이고 기간에 상관없이 2" #1500 밸브 1개 이상 납품실적 보유
	수동 3"이상	생산	최근5년간 납품실적이 10EA이상이고 기간에 상관없이 8" #900 밸브 1개 이상 납품실적 보유
- 초저온 체크밸브	Lift type	생산	최근5년간 납품실적이 50EA이상이고 기간에 상관없이 1(1/2)" #1500 밸브 1개 이상 납품실적 보유
	Swing type	생산	최근5년간 납품실적이 20EA이상이고 기간에 상관없이 12" #900 밸브 1개 이상 납품실적 보유
	Dual platetype	생산	최근5년간 납품실적이 5EA이상이고 기간에 상관없이 24" #300 밸브 1개 이상 납품실적 보유

품 목	규 격	사 용 구 분	적 격 기 준
- 초저온볼밸브	2"이하	생산	최근5년간 납품실적이 100EA이상이고 기간에 상관없이 2" #1500 밸브 1개 이상 납품실적 보유
	3"이상	생산	최근5년간 납품실적이 20EA이상이고 기간에 상관없이 12" #900 밸브 1개 이상 납품실적 보유
- 안 전 밸 브	초저온 미압용	생산	최근5년간 납품실적이 20EA이상이고 Pilot, Vacuum Relief 형식의 납품실적 보유
	초저온 고압용	생산	최근5년간 납품실적이 20EA이상이고 Pilot, Conventional 형식의 납품실적 보유
	천연가스용	공급	최근 5년간 납품실적이 20EA이상이고 기간에 상관없이 8" #300 × 10" #150 안전밸브 납품실적 보유
2. 절연조인트	4"까지	공통	최근5년간 납품실적이 100EA이상이고 기간에 상관없이 4" #600 1개이상 납품실적 보유
	6"이상	공통	최근5년간 납품실적이 50EA이상이고 기간에 상관없이 30" #600 1개이상 납품실적 보유
3. 계량설비	오리피스식	공통	오리피스 계량기를 자체생산하는 업체로서, 최근 5년간 납품실적이 #600 15열 이상이고 최근 5년간 가스분석기 및 유량컴퓨터를 조합한 계량시스템 3식 이상 납품실적 보유
	터빈미터식	공급	터빈계량기를 자체생산하는 업체로서, 최근5년간 납품실적 15열 이상이고 최근 5년간 가스분석기 및 유량컴퓨터를 조합한 계량시스템 3식 이상 납품실적 보유
	초음파식	공통	초음파 계량기를 자체생산하는 업체로서, 최근 5년간 납품실적이 #600 15열 이상이고 최근 5년간 가스분석기 및 유량컴퓨터를 조합한 계량시스템 3식 이상 납품실적 보유
4. 가스누출경보기	열선형반도체식	공통	최근5년간 납품실적이 50UNIT 이상
	접촉연소식	공통	최근5년간 납품실적이 50개 이상
5. 통제설비	SCADA(RTU)	공급	최근5년간 납품실적이 3식 이상
	ICSS (DCS,ESDS)	생산	최근 5년간 LNG Receiving Terminal or Natural Gas Liquefaction Plant에 DCS&ESD 시스템 설계, 납품 및 운전 실적 보유
6. 정압설비	4" 이하(Pilot controlled gas pressure regulator)	공급	최근5년간 납품실적이 #600, 20열 이상
	6" 이상(Pilot controlled gas pressure regulator)	공급	최근5년간 납품실적이 #600, 20열 이상
7. 무정전전원장치	3Φ [All IGBT 방식]	공급	UPS 직접생산 제조업체로서 최근5년간 3Φ 100KVA 이상(All IGBT 방식) 1식 이상 납품실적 보유
	3Φ Parallel type (IGBT방식 ,Isolated방식제외)	생산	UPS 직접생산 제조업체로서 최근 5년간 3Φ 120KVA 이상 병렬운전(All IGBT 방식(Isolated 방식 제외)) 1식 이상 납품실적 보유
8. 방폭형등기구	1Φ 220V(방전등)	공통	최근5년간 납품실적이 300EA 이상
	1Φ 220V(LED등)	공통	LED등기구 직접 생산제조업체로서 최근5년간 납품실적이 200 EA 이상

☐ **Reference list criteria**

Item	Size	Purpose	Criteria
1. Valves - Ball valve for natural gas	up to 4"	pipelines	Reference list should have more than 500ea for the last 5 years, and have more than 1ea for 4" #600 valve regardless of the period
	6" up to 8"	pipelines	Reference list should have more than 50ea for the last 5 years, and have more than 1ea for 8" #600 valve regardless of the period
	Over 10"	pipelines	Reference list should have more than 300ea for the last 5 years, and have more than 1ea for 30" #600 valve regardless of the period
	Buried type Valve	pipelines	Reference list should have more than 10ea for the last 5 years, and have more than 1ea for 30" #600 valve regardless of the period
	up to 4"	LNG terminals	Reference list should have more than 100ea for the last 5 years, and have more than 1ea for 4" #900 valve regardless of the period
	6" and over (Top Entry)	LNG terminals	Reference list should have more than 50ea for the last 5 years, and have more than 1ea for 30" #900 valve(Top Entry Type) regardless of the period
- Cryogenic Gate Valve	up to 2"	LNG terminals	Reference list should have more than 50ea for the last 5 years, and have more than 1ea for 2" #900 valve regardless of the period
	over 3"	LNG terminals	Reference list should have more than 100ea for the last 5 years, and have more than 1ea for 24" #900 valve regardless of the period
- Cryogenic Butterfly Valve	Cryogenic Butterfly Valve	LNG terminals	Reference list should have more than 50ea for the last 5 years, and have more than 1ea for 36" #300 valve regardless of the period
- Cryogenic Globe Valve	Control Valve up to #300	LNG terminals	Reference list should have more than 20ea for #300 valve for the last 5 years
	Control Valve over #300	LNG terminals	Reference list should have more than 20ea for the last 5 years, and have more than 1ea for 6" #900 valve regardless of the period
	Manual Globe Valve up to 2"	LNG terminals	Reference list should have more than 100ea for the last 5 years, and have more than 1ea for 2" #900 valve regardless of the period
	Manual Globe Valve over 3"	LNG terminals	Reference list should have more than 10ea for the last 5 years, and have more than 1ea for 4" #900 valve regardless of the period
- Cryogenic Check Valve	Lift type	LNG terminals	Reference list should have more than 50ea for the last 5 years, and have more than 1ea for 1(1/2)" #1500 valve regardless of the period
	Swing Type	LNG terminals	Reference list should have more than 20ea for the last 5 years, and have more than 1ea for 12" #900 valve regardless of the period
	Dual plate type	LNG terminals	Reference list should have more than 5ea for the last 5 years, and have more than 1ea for 24" #300 valve regardless of the period

Item	Size	Purpose	Criteria
- Cryogenic Ball Valve	up to 2"	LNG terminals	Reference list should have more than 100ea for the last 5 years, and have more than 1ea for 2" #1500 valve regardless of the period
	over 3"	LNG terminals	Reference list should have more than 20ea for the last 5 years, and have more than 1ea for 12" #900 valve regardless of the period
- Safety Valve	Cryogenic low pressure Valve	LNG terminals	Reference list should have more than 20ea for the last 5 years, and have delivery record of Pilot type and Vacuum Relief type
	Cryogenic high pressure Valve	LNG terminals	Reference list should have more than 20ea for the last 5 years, and have delivery record of Pilot type and Conventional type
	Natural Gas Valve	pipelines	Reference list should have more than 20ea for the last 5 years, and have more than 1ea for 8" #300 × 10" #150 valve regardless of the period
2. Insulation Joint	up to 4"	Common	Reference list should have more than 100ea for the last 5 years, and have more than 1ea for 4" #600 valve regardless of the period
	6" and over	Common	Reference list should have more than 50ea for the last 5 years, and have more than 1ea for 30" #600 valve regardless of the period
3. Metering System	Orifice Type	Common	As a manufacturer makes the Metering System of orifice type by itself, Reference list should have more than 16 lines for the last 5 years, and have more than 3 set for metering system combined with gas analyzer and flow computer for the last 5 years
	Turbine Type	pipelines	As a manufacturer makes the Metering System of turbine type by itself, Reference list should have more than 15 lines for the last 5 years, and have more than 3 set for metering system combined with gas analyzer and flow computer for the last 5 years
	Ultrasonic Type	Common	As a manufacturer makes the Metering System of ultrasonic type by itself, Reference list should have more than 15 lines of #600 for the last 5 years, and have more than 3 set for metering system combined with gas analyzer and flow computer for the last 5 years
4. Gas Leak Detection & Alarm System	Catalytic Semiconductor Combination Type	Common	Reference list should have more than 50 unit for the last 5 years
	Catalytic Combustion Type	Common	Reference list should have more than 50 unit for the last 5 years

Item	Size	Purpose	Criteria
5. Control System	SCADA(RTU)	pipelines	Reference list should have more than 3 set for the last 5 years
	ICSS (DCS, ESD)	LNG terminals	Reference list should have a record of system design, delivery and operation for DCS & ESD for the last 5 years at the LNG Receiving Terminal or Natural Gas Liquefaction Plant
6. Pressure regulation Unit	up to 4" (Pilot controlled gas pressure regulator)	pipelines	Reference list should have more than 20 lines for the last 5 years
	6" and over (Pilot controlled gas pressure regulator)	pipelines	Reference list should have more than 20 lines for the last 5 years
7. UPS	3Φ [All IGBT Type]	pipelines	As a manufacturer makes the UPS by itself, Reference list should have more than 1 set for 3Φ above 100KVA (All IGBT type) for the last 5 years
	3Φ Parallel type [All IGBT Type (but except isolated type)]	LNG terminals	As a manufacturer makes the UPS by itself, Reference list should have more than 1 set for 3Φ above 120KVA of parallel type (All IGBT type, but except isolated type) for the last 5 years
8 Light Fixture (Explosion proof)	1Φ 220V (discharge lamp)	Common	Reference list should have more than 300 ea for the last 5 years
	1Φ 220V (LED Lamp)	Common	As a manufacturers makes the LED light fixture by itself, Reference list should have more than 200 ea for the last 5 years

3. 품질 및 기술인증 내역

인증종류	인증대상품	인증번호	인 증 명 칭	인증일자	인증기관	비 고

* ISO 9000시리즈, ISO 14000시리즈, 특허, 실용신안, 의장등록 국가규격(DIN, NF, JIS, BS, ASME, UL, NEMA, KS등), 단체규격(검, 열, 전, GD, NT, KT등)

* 해당 인증서 사본 첨부

3. Quality & Technical authentication list(Application Item)

CERTIFICATION TITLE	CERTIFIED ITEM	CERTIFYING ORGANISATION	CETIFIED DATE	VALIDITY	REMARK
ISO 9000 SERIES					

* ISO 9000, ISO 14000, DIN, NF, JIS, BS, ASME, UL, NEMA, and so on
attach the copy of certification

4. 인력현황 (평가신청품목)

	총원	임원	사무	기 술				
				설계	기술개발	제작 (생산)	시험검사	품질관리
4년미만								
4년 ~ 7년미만								
7년 ~ 10년미만								
10년이상								
계								

* 조직도, 업무분장표 첨부

* 시험, 검사업무를 병행수행하는 경우는 시험검사 업무란에 기재)

* 상기인원이 보유하고 있는 자격증 사본 제출

* 인력현황은 국민연금관리공단에서 발행하는“사업장 가입자명부”를 첨부할 것

4. Employee status (Application Item)

	Total	Directing	Administrating	Technical				
				Designing	R&D	Manufacturing	Inspecting	QC
Group I								
Group II								
Group III								
Group IV								
Total								

- * Company Organization should be attached
- * in case a personnel has double roles, decide his/her main role and fill in the blanks
- * in case a personnel do testing & inspecting as well as QC, his/her role should be inspected
- * in case a personnel acquiring a personal technical certification, the copies of such certificate should be attached
- * Group I means regular force with less than 4 years experience, Group II means between 4 to 7 years, Group III means between 7 to 10 years, Group IV means more than 10 years

5. 설계능력(평가신청품목)

○ 설계수행 구분

자체설계	외주설계	기술제휴	비 고
설계분야	외주설계분야 외주업체명	기술제휴 설계분야 기술제휴 업체명	

○ 설계관련 컴퓨터 프로그램 보유현황

프로그램명	용 도	비 고

5. Design Capacity(Application Item)

○ Design accomplishment classification

Design part by Own	Design part from outsource	Technical tie-up	Remark
	Outsourcing Vender name & part	Technical tie-up company name & part	

○ Design program list

Program name	Description	Remark

6. 생산설비 LIST(평가신청품목)

NO	설비명	규 격	사용연수	수 량	용 도	비 고

6. Manufacturing equipment list(Application Item)

NO	Name	Size & Spec	Year	Quantity	Description	Remark

7. 시험 및 검사설비 LIST(평가신청품목)

NO	설비명	규 격	사용연수	수 량	용 도	비 고

7. Test & Inspection equipment list(Application Item)

NO	Name	Size & Spec	Year	Quantity	Description	Remark

8. 제작공정표, 작업표준서(평가신청품목)

8. Work procedure, chart, standard (Application Item)

9. 협력업체(외주)관리(평가해당품목)

외주처리 부분	외주업체명	외주업체주소	비고

9. Outsourcing list(Application Item)

Outsourcing part	Outsourcing Vender	Vender address	Remark

10. A/S 조직 현황

번호	조직명	주소	전담인력	담당자
1				
2				
3				

* 도착시간 :

10. Organization for after-sale service

NO	Organization name	Address	No. of manpower	Person in charge
1				
2				
3				

* Time needed for arriving at site : hours after emergency call