




## RPN KNOW-HOW FOR CHINA PROCUREMENT PACKAGES



WBS	Subassembly	Ref.	Component or operation	 <b>MEMBERS</b>
WBS 1,1	MAGNETS	<a href="#">1,1,2-C</a>	Magnet Supports	40-30, BOCCARD, BONITEMPO, CIMAT, COMEX NUCLEAIRE, GMP, GROUPE BONNANS, REEL, ROBATEL, SDMS, SETIS, USIS, VELAN
		<a href="#">1,1,3-C</a>	Correction Coils	
		<a href="#">1,1,5-A</a>	Feeders	
		<a href="#">1,1,6-A</a>	Toroidal Field Magnet Conductors	
		<a href="#">1,1,6-C</a>	Poloidal Field Magnet Conductors	
WBS 1,6	BLANKET SYSTEM	<a href="#">1,6,1-A</a>	Blanket First Wall	BOCCARD, BONITEMPO, CIMAT, COMEX NUCLEAIRE, GMP, GROUPE BONNANS, REEL, ROBATEL, SDMS, SETIS, USIS
		<a href="#">1,6,1-B</a>	Blanket Shield	
		<a href="#">1,6,3</a>	Blanket Module Connections	
WBS 2,3	REMOTE HANDLING	<a href="#">2,3,3</a>	Transfer Cask System	AMESYS, EKIU, COMEX NUCLEAIRE, FIATEQ, GMP, REEL, ROBATEL, SDM, USIS
WBS 3,1	VACUUM PUMP & FUELLING	<a href="#">3,1,6</a>	Gas Injector Valve Boxes & Glow Discharge Cleaning	40-30, AMESYS, BOCCARD, BONITEMPO, CIMAT, EKIU, COMEX NUCLEAIRE, FIATEQ, REEL, ROBATEL, SDMS, USIS, VELAN
WBS 4,1	PULSED POWER SUPPLY	<a href="#">4,1,1-B</a>	High Voltage Substation Materials	EKIU, AMESYS, BOCCARD, CIMAT, EKIU, REEL, SOM NUCLEAIRE
		<a href="#">4,1,2</a>	AC/DC Convertors	
WBS 5,5	DIAGNOSTICS	<a href="#">5,5-A</a>	Magnetic measurements	40-30, AMESYS, EKIU, COMEX NUCLEAIRE, FIATEQ, SDMS, SETARAM, SITES, SOM NUCLEAIRE
		<a href="#">5,5-B</a>	Neutron measurements	
		<a href="#">5,5-C</a>	Optical systems	
		<a href="#">5,5-D</a>	Bolometry	
		<a href="#">5,5-E</a>	Spectroscopic systems	
		<a href="#">5,5-F</a>	Microwave systems	
		<a href="#">5,5-G</a>	Systems for machine operation	
		<a href="#">5,5-N</a>	Diagnostics engineering	



## → WBS 1,1 - MAGNETS

RPN MEMBERS	KNOW-HOW
<b>40-30 (9)</b> <b>BOCCARD (2, 6, 7, 8, 13)</b> <b>BONITEMPO (6, 7, 10, 11, 13)</b> <b>BUREAU VERITAS (4)</b> <b>CIMAT (3, 4, 6, 9, 13)</b> <b>COMEX NUCLEAIRE (3, 4, 6, 7, 9, 13)</b> <b>GARLOCK (9)</b> <b>GMP (2, 4)</b> <b>GROUPE BONNANS (2)</b> <b>REEL (2, 3, 4, 9, 13)</b> <b>ROBATEL (4, 13)</b> <b>SDMS (6, 7, 10, 13)</b> <b>SETIS (11,13)</b> <b>USIS (2, 3, 4, 6, 12, 13)</b> <b>VELAN (7)</b>	<div style="text-align: right;"> <span style="color: red;">■</span> <i>Know-how included by RPN</i>  <span style="background-color: gray; display: inline-block; width: 10px; height: 10px; vertical-align: middle;"></span> <i>Non-included know-how</i> </div> <ol style="list-style-type: none"> <li>1. Cable Winding (large length and big section)</li> <li>2. Stainless steel machining (thick plate)</li> <li>3. TIG, MIG processes</li> <li>4. Manual welding</li> <li>5. Vacuum impregnation</li> <li>6. Stainless steel boilermaking</li> <li>7. Cryogenics</li> <li>8. Thermal insulation</li> <li>9. Helium waterproof control</li> <li>10. Large section cable, supraconductor</li> <li>11. Wiredrawing, drawing, forming, rolling</li> <li>12. Heat treatments</li> <li>13. Stainless steel boilermaking (thin plate)</li> </ol>

## → WBS 1,6 - BLANKET SYSTEM

RPN MEMBERS	KNOW-HOW
<b>BOCCARD (6, 7, 9)</b> <b>BONITEMPO (1, 4, 6, 7, 10)</b> <b>BUREAU VERITAS (3, 9)</b> <b>CIMAT (6, 7)</b> <b>COMEX NUCLEAIRE (2, 3, 5, 6, 9)</b> <b>GMP (1, 4)</b> <b>GROUPE BONNANS (1, 4)</b> <b>REEL (2, 4, 6, 9)</b> <b>ROBATEL (6)</b> <b>SDMS (2, 3, 5, 6, 7, 9, 10)</b> <b>SETIS (4, 6)</b> <b>USIS (4, 6, 7)</b>	<div style="text-align: right;"> <span style="color: red;">■</span> <i>Know-how included by RPN</i>  <span style="background-color: gray; display: inline-block; width: 10px; height: 10px; vertical-align: middle;"></span> <i>Non-included know-how</i> </div> <ol style="list-style-type: none"> <li>1. Beryllium, copper machining</li> <li>2. Heterogeneous Material liaison (soldering, electron beam welding ..)</li> <li>3. Leak tight weld connection of stainless piping for pressurized water (TIG or laser processes)</li> <li>4. Stainless steel machining, Forming , Titanium machining</li> <li>5. Plasma deposition, TIG welding or laser</li> <li>6. Boilermaking</li> <li>7. Stainless steel piping</li> <li>8. Isostatic compression on stainless steel (HIP)</li> <li>9. TIG and electron beam welding on stainless</li> <li>10. Mounting, copper alloy parts cooling down (CuCrZr)</li> </ol>



### → WBS 2,3 - REMOTE HANDLING

RPN MEMBERS	KNOW-HOW
AMESYS (1, 4, 5) COMEX NUCLEAIRE (1, 2, 3, 4, 5) EKIU (4, 5) FIATEQ (1, 5) GARLOCK (2) GMP (2) REEL (1, 2, 4, 5) ROBATEL (3) SDMS (1, 2, 3, 4, 5) USIS (2)	1. Robotics 2. High precision mechanical structure 3. Shielding of components submitted to radiation 4. System integration 5. Remote Handling

### → WBS 3,1 - VACUUM PUMP & FUELLING

RPN MEMBERS	KNOW-HOW
40-30 (6, 11) AMESYS (12) BOCCARD (5) BONITEMPO (1, 3) BUREAU VERITAS (2, 3) CIMAT (1, 9) EKIU (4, 12) COMEX NUCLEAIRE (1, 2, 3, 4, 5, 6, 2, 14) FIATEQ (4, 12) REEL (1, 3) ROBATEL (1, 2, 3) SDMS (1, 2, 3, 4, 5, 6, 14) USIS (1, 3, 9) VELAN (5)	1. Copper and Stainless steel boilermaking 2. Copper welding helium airtight, thermalization net 3. Leak tight stainless steel welding pressurized water Integration 4. Instrumentation 5. Cryogenics 6. Set-up, cryogenics pumps connecting 7. Vacuum pumps manufacturing 8. Gas desorption 9. Small piping 10. Pipes and drawing-in net 11. Mass spectrometry 12. Automated system 13. Secondary standard pumps manufacturing (turbo- molecular, molecular, hybrid, ionic, cryogenics) 14. Double-waterproof assembly Tritium compatible



**→ WBS 4,1 - PULSED POWER SUPPLY**

RPN MEMBERS	KNOW-HOW <span style="float: right;"> <span style="color: red;">■</span> <i>Know-how included by RPN</i>  <span style="color: gray;">■</span> <i>Non-included know-how</i> </span>
EKIUM (4) AMESYS (4) BOCCARD (8) BUREAU VERITAS (1) CIMAT (5) EKIUM (3, 4) REEL (5) SOM NUCLEAIRE (8)	<ol style="list-style-type: none"> <li>1. Civil engineering</li> <li>2. Mechanics</li> <li>3. Wire pulling</li> <li>4. Automation – control</li> <li>5. Handling</li> <li>6. Hydraulic</li> <li>7. Electromechanics</li> <li>8. Water cooling systems</li> </ol>

**→ WBS 5,5 - DIAGNOSTICS**

RPN MEMBERS	KNOW-HOW <span style="float: right;"> <span style="color: red;">■</span> <i>Know-how included by RPN</i>  <span style="color: gray;">■</span> <i>Non-included know-how</i> </span>
40-30 (5) AMESYS (1, 2, 5, 8, 11) BUREAU VERITAS (11) COMEX NUCLEAIRE (8, 9, 10, 11, 12, 13) EKIUM (6, 11) FIATEQ (1, 2, 5, 6, 11) FOC TRANSMISSIONS (12) SDMS (6, 12, 13) SETARAM (1, 2, 13) SITES (1, 3, 10, 11) SOM NUCLEAIRE (11, 12, 13)	<ol style="list-style-type: none"> <li>1. Design, Sensor manufacturing, connectors, electronics</li> <li>2. Design, Instruments manufacturing for neutron measures</li> <li>3. Optics</li> <li>4. Laser cutting</li> <li>5. Electronics</li> <li>6. Design, Instruments manufacturing for measuring radiation (bolometric cameras)</li> <li>7. Spectroscopic</li> <li>8. Imagery signal processing</li> <li>9. Micro-wave technology, radar specialist</li> <li>10. Optics and infrared radiation</li> <li>11. Engineering</li> <li>12. Mechanics</li> <li>13. Thermal</li> <li>14. Connectors</li> <li>15. Wiring</li> </ol>