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**STEAM SUPPLY AGREEMENT**

between

**SOLVAY S.A.**

and

**ROSEN ROSIGNANO S.p.A.**



STEAM SUPPLY AGREEMENT

This Agreement

is made by and among

SOLVAY S.A. incorporated in Brussels, Belgium and with a secondary registered office at 6 Via Piave, ROSIGNANO SOLVAY, in the "commune di Rosignano Marittimo (LI)", represented by its General Representative in Italy, Ing. Georges Theys, hereafter called for the sake of brevity SOLVAY

and

ROSEN ROSIGNANO ENERGIA S.p.A. with registered office at 6 Via Piave, ROSIGNANO SOLVAY, in the "Commune di Rosignano Marittimo (LI)" represented by its Managing Director, Ing. Jean Venturini hereafter called, for the sake of brevity, ROSEN



CONSIDERING

- that SOLVAY owns a manufacturing plant in the Commune di Rosignano Marittimo with characteristics that meet the 09.91 Law requirements. This Law is stimulating the development of combined steam and power plants with high energy conversion ratios in line with the New National Energy Plan as defined by the Law of 09.91;
- that SOLVAY can, in the above mentioned plant, make use of considerable quantities of steam to render economically viable the construction of a combined steam and power plant with an approximate gross electric capacity of 360 MW and a useful thermal capacity of 295 MW, with a national savings of some 300 Ktep per annum thus obtaining a corresponding reduction of environmental impact;
- that ROSEN, taking into account the possibilities of SOLVAY, is interested in building within the SOLVAY plant a combined steam and power plant, hereafter called the CHP Plant, to consist of :
  - o 2 groups each consisting of a gas turbine and an heat recovery boiler capable of producing some 570 t/h of steam at 70, 16, 3 bar and 290 MW of electric energy;

*[Handwritten signature]*

ATS p 7 (2<sup>o</sup> flow rate) x 2

*[Handwritten mark]*

- o 1 turbo alternator capable of producing approximately 70 MW of electric energy equipped with a condensation turbine with intermediary tapping of steam at 41 and 15 bar to be supplied to the SOLVAY plant;
  - o 1 condenser capable of condensing approximately 300 t/h of steam
  - that ROSEN, after the building of such a CHP Plant, shall produce steam and supply SOLVAY steam requirements and produce electric energy for sale to ENEL at conditions set by CIP 06.92 decree and on the basis of a standard agreement "convenzione tipo" attached to the D.M. dated 25.09.1992;
  - that the CHP Plant is assimilated to power production plant using renewable sources of energy as stated in 29.07.1992 "Ministero dell'Industria del Commercio e dell'Artigianato" authorization decree for the CHP Plant on the basis of the criteria defined in CIP 34/90 (the "Assimilation");
  - that SOLVAY has applied for and obtained in its own name, with obligation to transfer them in favour of ROSEN, all and every administrative permits necessary for erecting the CHP Plant;
  - that SOLVAY, in order to allow ROSEN to produce electric energy with the dispositions provided for by the Law of 09.91 on power production plants using renewable and assimilated sources of energy and in consideration of the commitment of ROSEN to supply SOLVAY with its steam needs, pledges to offtake (1) a quantity of steam sufficient to obtain for the CHP Plant an energy index (Ien, as defined by CIP 06.92) exceeding 0.6 for the First Period according to terms and modalities as defined in Articles 1 and 19 and (2) thereafter a quantity of steam as defined in Article 1.
  - that SOLVAY in view of securing its steam requirements shall put at ROSEN 's disposal, at conditions stipulated in a separate agreement, among others, a boiler capable of producing 140 t/h of steam at 40 bar, called thereafter Emergency Boiler, such Emergency Boiler with the CHP Plant being called hereinafter the Plant;
  - that SOLVAY in view of securing its steam requirements and sale by ROSEN of electricity to ENEL shall supply the Utilities needed through the construction period of the Plant and the Utilities needed for the operation of the Plant, including water supply for the fire-fighting network, at conditions stipulated in a separate agreement;
  - that SOLVAY in view of securing its steam requirements and sale by ROSEN of electricity to ENEL shall put at ROSEN's disposal the land, located in its own plant at Rosignano, at conditions and times stipulated in a separate agreement, on which to build the CHP Plant, the natural gas reduction station, the electrical sub-station and the ENEL's sub-station;
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- 1.4. Steam shall be supplied at 41 bar and 15 bar delivery pressures.

Steam at 41 bar shall be supplied within a range from 60 to 165 t/h with an average of 125 t/h and steam at 15 bar within the range from 100 to 405 t/h with an average of 285 t/h, for a total supply ranging from 220 t/h to 465 t/h as indicated in Appendix 1. These average quantities are called thereafter "Steam Reference Quantities".

During one gas turbine unit outages the maximum commitment of ROSEN to supply will be reduced from 465 t/h to 390 t/h; during both gas turbines units outages the maximum commitment of ROSEN to supply will be reduced from 465 t/h to 140 t/h.

- 1.5. The Plant has been designed to make sure that SOLVAY's steam requirements are met. No stopping or control equipment likely to stop or reduce the delivery of steam to SOLVAY are to be installed in the Plant or on the delivery lines except those necessary to protect people and property.

Within the above limits, in any case and at any time, all steam that ROSEN is able to produce shall be made available to SOLVAY to meet its steam requirements, by priority on any other use of steam except what is needed for the normal operation of the Plant.

- 1.6. Without prejudice to Article 1.3, SOLVAY under its responsibility shall be entitled to use the steam supplied for whatever use including transfer to third parties.

#### Article 2 - Modalities of Offtake

Within the area ABCDE shown in Appendix 1 SOLVAY shall determine at any time and at its sole discretion its hourly steam offtakes (and including for avoidance of doubt distribution between 41 bar and 15 bar).

In due time to allow ROSEN to submit to ENEL its annual power production plan, SOLVAY shall inform ROSEN of its reasonable estimates for the coming calendar year (the relevant year) of its yearly average 41 bar and 15 bar steam requirements possibly differentiating between full and empty hours, expressed in tons/hour (the "Steam Revised Reference Quantities").

#### Article 3 - Points of Delivery

The points of delivery of 41 and 15 bar steam are the measuring instruments outlet flanges as indicated on drawings n° R 207002, V and R 207001, VI attached herewith in Appendix 4.

The transfer of property of steam occurs at the points of delivery.



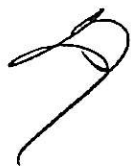
- that SOLVAY currently covers its steam and power needs through its own generating facilities. From Commercial Operation Date operation of those facilities shall be suspended or limited to production of steam which is compatible with fulfilment by SOLVAY of its obligations vis-a-vis ROSEN under this Agreement and which does not jeopardize Rosen's operating permits.

ROSEN and SOLVAY agree on the following :

The considerations and the appendices are an integral and substantial part of this agreement.

#### Article 1 - Steam Supply/Offtake

- 1.1. ROSEN is committed for the duration of this agreement to put at SOLVAY's disposal for 8 760 hours per year a contractual annual quantity of steam according to SOLVAY requirements up to 3 591 600 tons corresponding to an average of 410 t/h (3 601 440 tons for leap years).
- 1.2. SOLVAY is committed for the First Period defined in Article 19 to offtake an annual quantity of steam sufficient to obtain, for the Plant, an energy index Ien greater than 0.6. The terms and modalities of SOLVAY undertaking are defined in Article 14.
- 1.3. After the First Period, and until termination or expiration of this Agreement, it is agreed as follows :
  - SOLVAY shall offtake not less than 220 tons/hour of steam on a yearly average basis. SOLVAY could decide to reduce on a permanent basis its steam offtake below 220 t/h but such decision is subject to a prior agreement with ROSEN (both parties acting reasonably). This agreement will define the terms and conditions of the implementation of such decision including adaptation of the respective commitments under this Agreement, sharing of the investment cost needed while maintaining the cogeneration status of ROSEN and sharing of the corresponding additional electrical revenue. This Steam Supply Agreement will be adapted at that time to reflect the reduction of steam offtake and the other terms and conditions agreed upon.
  - Notwithstanding the above SOLVAY shall if needed to preserve the Assimilation of ROSEN continue to offtake and consume a few tons/hour on a yearly average basis.



**Article 4 - Steam Characteristics**

Steam is supplied at points of delivery with the specifications stipulated in Appendix 2, part 1.

**Article 5 - Steam Measurement**


- 5.1. ROSEN and SOLVAY shall define procedures and means to verify the specifications of steam supplied. It is ROSEN's responsibility to supply to SOLVAY data pertaining to the supplied steam such as the pressure, temperature, flow, etc. in real time and summary reports according to modalities fixed by mutual agreement.
- 5.2. Measuring instruments necessary to measure steam supplied to SOLVAY shall be installed at points of delivery (Article 3) or as close as possible. Measuring instruments are ROSEN's property who are responsible for their maintenance. The accuracy of the measuring instruments to be installed are indicated in Appendix 2, part 2.

ROSEN shall be responsible to check periodically the measuring instruments at least once a year. SOLVAY's technical services may participate in these periodical verifications which shall be notified accordingly.

- 5.3. In case of doubt regarding the accuracy of the instruments measuring the supply, SOLVAY may request a contradictory checking of their calibration. Checking shall be made by technical services of both ROSEN and SOLVAY not later than eight days from the date they were requested. Such verifications shall be made free of charge by both parties.

If during a checking, the deviation of a metering instrument is found to be greater than the expected deviation guaranteed by the manufacturer by more than 1 % the metering instrument will be declared inaccurate and will be recalibrated.

- 5.4. SOLVAY's and ROSEN's technical services may hire the services of an independent, mutually acceptable company to check the instruments. In the case such an external verification is carried out instead of the annual verification, the costs will be charged to ROSEN, in all other cases the costs will be evenly divided between ROSEN and SOLVAY.





For each maintenance outage, ROSEN shall indicate, if the plant is to be totally or partially shut-down, the expected date of restart as well as the possible extension of the shut-down period.

The scheduled maintenance periods shall occur in principle during the month of August and during week-ends.

#### **Article 9 - Emergency Boiler Utilization**

- 9.1 As of Commercial Operation Date and subject to the acceptance of the HP3 boiler per ROSEN under the HP3 boiler lease contract during unscheduled outages of one or two gas-turbines or scheduled outages or periods during which ENEL shall ask ROSEN to reduce gas-turbines operation under their technical capacities (and including circumstances for which ROSEN would be entitled to call for Force Majeure under Article 28), ROSEN shall put in service the Emergency Boiler and shall supply all steam produced therefrom to SOLVAY as per conditions of Article 6, with the limitation given hereafter.
- 9.2. By exception to Article 6, if during the unscheduled outages of one or two gas-turbines and the periods during which ENEL shall ask ROSEN to reduce gas turbines operations under their technical capacities (and including circumstances for which ROSEN would be entitled to call for Force Majeure under Article 28), the Emergency Boiler production exceeds 60 equivalent days per year at full capacity or if during the periods during which ENEL shall ask ROSEN to reduce gas turbines operations under their technical capacities including circumstances for which ROSEN would be entitled to call for Force Majeure under Article 28, the Emergency Boiler production exceeds 45 equivalent days per year at full capacity, for the periods in excess of the limits referred to hereabove, SOLVAY shall pay the additional cost of operation of the HP3 boiler incurred by ROSEN in order to produce steam at the level as defined by SOLVAY, such additional cost to be substantiated by reasonable evidence.
- 9.3. ROSEN will be relieved from any obligation to put the HP3 boiler into use if the HP3 Boiler Lease Contract has been terminated by SOLVAY. This provision does not prejudice to any right of SOLVAY if such termination is based on Rosen's breach of its obligations under this Agreement or the HP3 Boiler Lease Contract.

#### **Article 10 - Commissioning, Start-up, Performance Test - Provisional Programme**

Both parties have agreed that a detailed plan shall be prepared not later than at the beginning of the commissioning phase of the CHP Plant which will stipulate respective obligations during the commissioning phase, the start-up and the contractual tests.

During such period of time SOLVAY shall, within the technical operating constraints of the SOLVAY plant, take delivery of the steam produced.

**Article 11 - Disconnecting Steam Uses**

Without prejudice of Article 1 and Article 9, in order to secure the operation of the CHP Plant during occurrences of unplanned shutdowns of one or possibly two gas turbines, SOLVAY agrees to study and implement a procedure, even automatically controlled, of disconnecting some of its steam uses upon ROSEN 's request.

**Article 12 - Right of Refusal**

In case the pressure and/or temperature of steam are outside the contractual limits as stipulated in Article 4, ROSEN shall reestablish the correct levels as soon as possible.

SOLVAY has the right to refuse steam, that is to interrupt steam offtake, and ROSEN shall pay such penalties as stipulated in Article 13, in the case the pressure will reach, the following values :

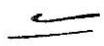

- pressure of steam at 41 bar is greater than or equal to 45.5 bara or smaller than or equal to 38 bara
- pressure of steam at 15 bar is greater than or equal to 19.5 bara or smaller than or equal to 11 bara
- pressure of steam from the Emergency Boiler is greater than or equal to 44.5 bara or smaller than 37 bara.

ROSEN shall only accept the dynamic variations of the SOLVAY steam offtakes corresponding to those allowed by the steam turbine and its auxiliaries according to the ROSEN Technical Specification in the frame of the EPC contract.

**Article 13 - Supply of Steam : Penalty - Liability**

- 13.1.0. In case of a total default of supply of steam by ROSEN, or of refusal on the part of SOLVAY pursuant to Article 12, ROSEN shall pay a penalty equivalent to 100 million ITL (1993) each time such an event occurs; whenever the default lasts more than 24 hours the said penalty shall be paid for each additional period of 24 hours.

In case of refusal by SOLVAY pursuant to Article 12, penalties shall only be due if SOLVAY can prove that it did suffer any damage from the steam pressure not being within the ranges as per Article 12.





## Part 1

### Steam specifications at delivery points

#### 1. CHP Plant

41 bar steam Pressure : 41 bara with -0/+0.5 bar tolerance  
Temperature : 422 °C with tolerance of +10/-5 °C

15 bar steam Pressure : 15 bara with -0/+0.5 bar tolerance  
Temperature : 272 °C with tolerance of +10/-5 °C

#### 2. Emergency Boiler

41 bar steam Pressure 40 bara with -0/+0.5 bar tolerance  
Temperature 420 °C with tolerance of +10/-5 °C.

Moreover the steam shall comply with the following requirements :

- Na + K (sodium + potassium) < 0.01 ppm
- SiO<sub>2</sub> (silica) < 0.02 ppm
- Conductivity < 0.3 micro S/cm
- Fe (iron) < 0.020 ppm
- Cu (copper) < 0.003 ppm
- Oxygen < 0.01 ppm
- ph of the condensate from 8.5 to 11.0

Chemicals to be used as additives will have to be approved by SOLVAY.

## Part 2

### Accuracy of the measuring instruments

Pressure : ± 0.25 %  
Temperature : ± 0.25 %  
Flow quantity : ± 1 %

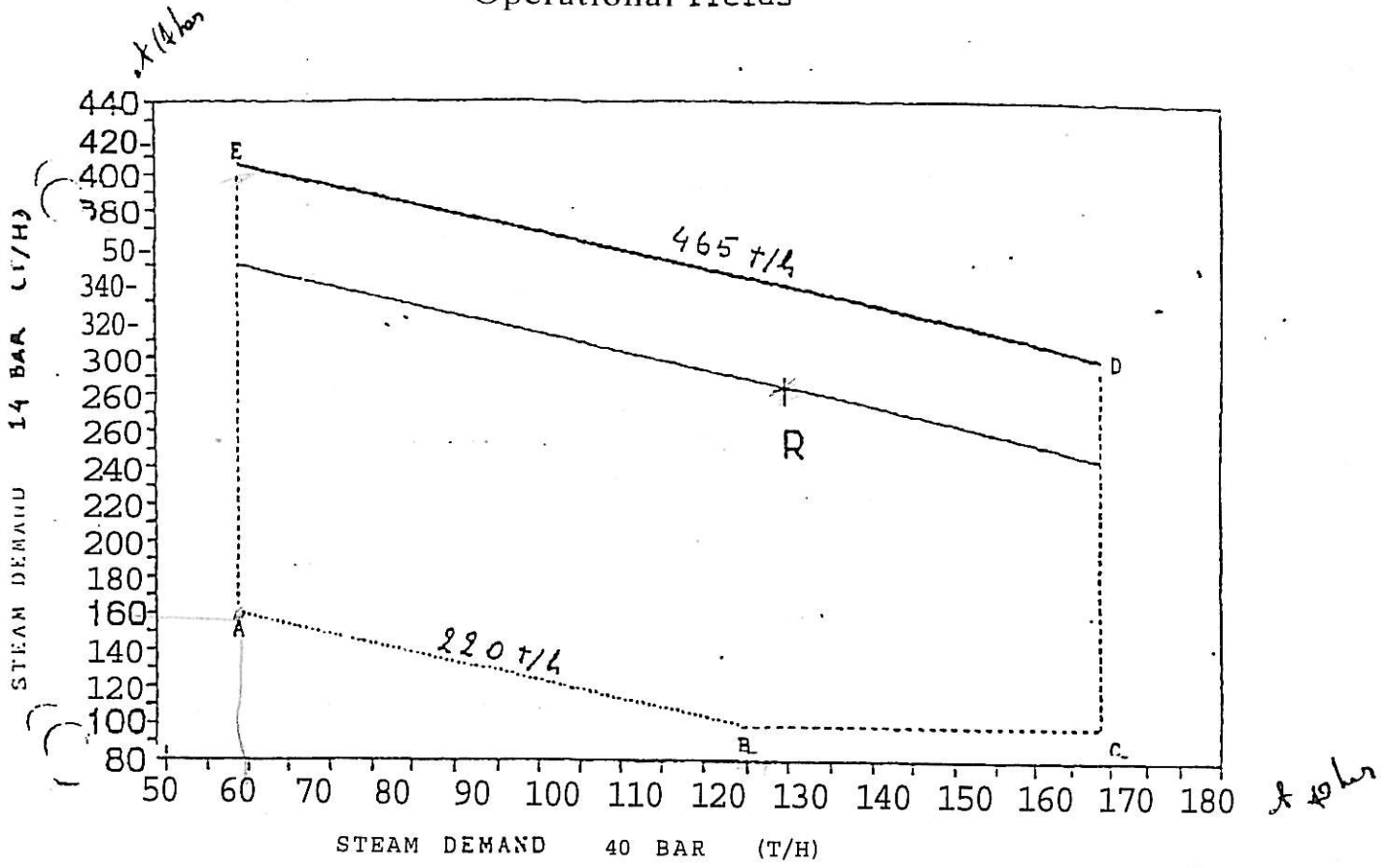


### Steam supply (consumption) diagram

Fig. 1

ROSIGNANO-SOLVAY COMBINED STEAM POWER PLANT

Operational fields



— STEAM OFFTAKE = 465 T/H — STEAM OFFTAKE = 410 T/H --- STEAM OFFTAKE = 220 T/H

point R	= reference	point A		point B	
@ 40 bar	= 125 t/h	@ 40 bar	= 60 t/h	@ 40 bar	= 120 t/h
@ 14 bar	= 285 t/h	@ 14 bar	= 160 t/h	@ 14 bar	= 100 t/h
total steam	= 410 t/h	total	= 220 t/h	total	= 220 t/h
point C		point D		point E	
@ 40 bar	= 165 t/h	@ 40 bar	= 165 t/h	@ 40 bar	= 60 t/h
@ 14 bar	= 100 t/h	@ 14 bar	= 300 t/h	@ 14 bar	= 405 t/h
total steam	= 265 t/h	total	= 465 t/h	total	= 465 t/h

The word bar on this page means barg (and not bara).