# MVM EGI LIST OF REFERENCES

MVM EGI



# LIST OF REFERENCES


1. Power & Process Cooling Systems ..... 3
1.1 Dry and Dry/Wet Cooling Systems ..... 3
1.2 Wet Cooling Systems ..... 9
1.3 Auxiliary & Process Air Coolers ..... 12
2. Power Engineering & Process Technology ..... 19
2.1 Conventional Heat Production - Boiler and Heating Plants ..... 19
2.2 Conventional Heat Production - Power and Heating Plants ..... 22
2.3 Heat Recovery Units ..... 26
2.4 Nuclear power plant related engineering and service projects ..... 31
2.5 Water Treatment Projects ..... 33
2.6 Fuel Handling and Storage Plants ..... 35
2.7 Power Plant Waste Processing and Disposal Systems (Dense Slurry Systems) ..... 36
2.8 Heat Transfer Oil Boiler Plants ..... 38
2.9 Gas Engine Heating Plants ..... 39
2.10 Biomass Projects ..... 40
Contacts ..... 41

# 1. POWER & PROCESS COOLING SYSTEMS

## 1.1 DRY AND DRY/WET COOLING SYSTEMS

| Ref. No. | Description | Country | Turbine Power (MW) | Commis-sioning | Remarks |
|---|---|---|---|---|---|
| 1. | Pilot plant | Hungary | 0,8 | 1954 | Natural draft dry cooling tower |
| 2. | Dunaújváros Steel Mill | Hungary | 16 | 1962 | Natural draft dry cooling tower |
| 3. | Rugeley Power Station, Unit V. | UK | 120 | 1962 | Natural draft dry cooling tower, DC jet condenser |
| 4. | Eilenburg Chemical Works | Germany | 5,3 | 1964 | Mechanical draft dry cooling tower |
| 5. | Karaganda Steel Mill, Unit I. | Kazakhstan | 6 | 1968 | Mechanical draft dry cooling tower |
| 6. | Karaganda Steel Mill, Unit II. | Kazakhstan | 6 | 1968 | Mechanical draft dry cooling tower |
| 7. | Ibbenbüren Power Station | Germany | 150 | 1967 | Natural draft dry cooling tower, DC jet condenser |
| 8. | Mátra Power Station, Unit I. | Hungary | 100 | 1969 | Natural draft dry cooling tower, DC jet condenser |
| 9. | Mátra Power Station, Unit II. | Hungary | 100 | 1970 | Natural draft dry cooling tower, DC jet condenser |
| 10. . | Razdan Power Station, Unit I. | Armenia | 210 | 1970 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 11. | Razdan Power Station, Unit II. | Armenia | 210 | 1971 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 12. | Razdan Power Station, Unit III. | Armenia | 210 | 1971 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 13. | Flötzersteig Incinerator | Austria | 3 | 1970 | Natural draft dry cooling tower |
| 14. | Mátra Power Station, Unit IV. | Hungary | 220 | 1972 | Natural draft dry cooling tower, DC jet condenser |
| 15. | Mátra Power Station, Unit V. | Hungary | 220 | 1972 | Natural draft dry cooling tower, DC jet condenser |
| 16. | Bilibino Nuclear Power Station Unit I. | Russia | 12 | 1972 | Mechanical draft dry cooling tower |
| 17. | Bilibino Nuclear Power Station, Unit II. | Russia | 12 | 1972 | Mechanical draft dry cooling tower |
| 18. | Bilibino Nuclear Power Station, Unit III. | Russia | 12 | 1973 | Mechanical draft dry cooling tower |
| 19. | Bilibino Nuclear Power Station, Unit IV. | Russia | 12 | 1973 | Mechanical draft dry cooling tower |
| 20. | Razdan Power Station, Unit IV. | Armenia | 210 | 1974 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 21. | Kanegafuchi Chemical Works | Japan | 60 | 1974 | Mechanical draft dry cooling tower with supplementary spraying |
| 22. | Ivanovo Power Station, Unit V. | Russia | 210 | 1978 | Natural draft dry cooling tower with supplementary spraying, DC jet condenser |
| 23. | Great Isfahan Power Station, Unit I. | Iran | 210 | 1984 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 24. | Great Isfahan Power Station, Unit II. | Iran | 210 | 1985 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 25. | Great Isfahan Power Station, Unit III. | Iran | 210 | 1985 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 26. | Great Isfahan Power Station, Unit IV. | Iran | 210 | 1986 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 27. | Solar Power Station | Ukraine | 5 | 1986 | Mechanical draft dry cooling tower |

## Dry and Dry/Wet Cooling Systems

| Ref. No. | Description | Country | Turbine Power (MW) | Commis-sioning | Remarks |
|---|---|---|---|---|---|
| 28. | Trakya Power Station, Unit A. | Turkey | 100 | 1986 | Natural draft dry cooling tower, DC jet condenser, peak coolers |
| 29. | Trakya Power Station, Unit B. | Turkey | 100 | 1987 | Natural draft dry cooling tower, DC jet condenser, peak coolers |
| 30. | Datong Power Station, Unit V. | China | 210 | 1987 | Natural draft dry cooling tower, DC jet condenser |
| 31. | Datong Power Station, Unit VI. | China | 210 | 1988 | Natural draft dry cooling tower, DC jet condenser |
| 32. | Trakya Power Station, Unit C. | Turkey | 100 | 1988 | Natural draft dry cooling tower, DC jet condenser, peak coolers |
| 33. | Trakya Power Station, Unit D. | Turkey | 100 | 1988 | Natural draft dry cooling tower, DC jet condenser, peak coolers |
| 34. | Shahid Rajai Power Station, Unit I. | Iran | 250 | 1992 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 35. | Shahid Rajai Power Station, Unit II. | Iran | 250 | 1993 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 36. | Teshrin Power Station, Unit I. | Syria | 210 | 1993 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 37. | Shahid Rajai Power Station, Unit III. | Iran | 250 | 1993 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 38. | Teshrin Power Station, Unit II. | Syria | 210 | 1993 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 39. | Fengzhen Power Station, Unit III. | China | 210 | 1993 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 40. | Fengzhen Power Station, Unit IV. | China | 210 | 1994 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 41. | Privodino Compressor Station | Russia | 15.8 | 1995 | Mechanical draft dry cooling tower |
| 42. | Shahid Rajai Power Station, Unit IV. | Iran | 250 | 1994 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 43. | Great Isfahan Power Station Extension, Unit V. | Iran | 210 | 1995 | Natural draft dry cooling tower, DC jet condenser |
| 44. | Fengzhen Power Station, Unit V. | China | 210 | 1995 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 45. | Hebel, Zehdenick | Germany | | 1995 | Direct air cooled condenser, extruded aluminum fins with carbon steel core tubes |
| 46. | Fengzhen Power Station, Unit VI. | China | 210 | 1996 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 47. | Great Isfahan Power Station Extension, Unit VIII. | Iran | 210 | 1997 | Natural draft dry cooling tower, DC jet condenser |
| 48. | Kanegafuchi Chemical Works | Japan | 60 | 1998 | Mechanical draft dry cooling tower with supplementary spraying, rebundling |
| 49. | Mátra Power Station, Unit IV-V. | Hungary | 220 | 1998 | Wet cooling tower add on to Unit IV-V to create hybrid dry/wet cooling system |
| 50. | Great Isfahan Power Station Extension, Unit VI. | Iran | 210 | 1998 | Natural draft dry cooling tower, DC jet condenser |
| 51. | Great Isfahan Power Station Extension, Unit VII. | Iran | 210 | 1999 | Natural draft dry cooling tower, DC jet condenser |
| 52. | Razdan Power Station, Unit V. | Armenia | 300 | 1999 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 53. | Bursa 700 MW CCPP, Unit A. | Turkey | 240 | 1999 | Natural draft dry cooling tower, DC jet condenser, peak coolers |
| 54. | Bursa 700 MW CCPP, Unit B. | Turkey | 240 | 1999 | Natural draft dry cooling tower, DC jet condenser, peak coolers |
| 55. | Arak Power Station, Unit I. | Iran | 325 | 1999 | Natural draft dry cooling tower,designed by EGI, built by 3rd party. |

## Dry and Dry/Wet Cooling Systems

| Ref. No. | Description | Country | Turbine Power (MW) | Commis-sioning | Remarks |
|---|---|---|---|---|---|
| 56. | Arak Power Station, Unit I. | Iran | 325 | 1999 | Natural draft dry cooling tower,designed by EGI, built by 3rd party. |
| 57. | Arak Power Station, Unit II. | Iran | 325 | 1999 | Natural draft dry cooling tower,designed by EGI, built by 3rd party. |
| 58. | Montazer Ghaem 320 MW CCPP, Unit I. | Iran | 105 | 1999 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 59. | Razdan Power Station, Unit VI. | Armenia | 300 | 2000 | Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers |
| 60. | Arak Power Station Unit IV. | Iran | 325 | 2001 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 61. | Montazer Ghaem 320 MW CCPP, Unit II. | Iran | 105 | 2000 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 62. | Montazer Ghaem 320 MW CCPP, Unit III. | Iran | 105 | 2001 | Natural draft dry cooling tower designed by EGI, built by 3rd party |
| 63. | Al-Zara Power Station, Unit I. | Syria | 220 | 2001 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 64. | Al-Zara Power Station, Unit II. | Syria | 220 | 2001 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 65. | Al-Zara Power Station, Unit III. | Syria | 220 | 2001 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 66. | Újpest 100 MW CCPP | Hungary | 36 | 2001 | Forced draft dry/ deluged cooling tower |
| 67. | Nowra Plant | Australia | 20 | 2002 | Direct air cooled condenser, single row, all aluminum heat exchanger (SKYVE) |
| 68. | Dorog Waste Incineration Plant | Hungary | 3 | 2002 | Direct air cooled condenser, extruded aluminum fins with carbon steel core tubes |
| 69. | Gebze 777 MW CCPP, Unit I. | Turkey | 270 | 2002 | Natural draft dry cooling tower, DC jet condenser |
| 70. | Gebze 777 MW CCPP, Unit II. | Turkey | 270 | 2002 | Natural draft dry cooling tower, DC jet condenser |
| 71. | Adapazari 777 MW CCPP, Unit I. | Turkey | 270 | 2002 | Natural draft dry cooling tower, DC jet condenser |
| 72. | CAN 160 MW CFB based Thermal Power Station, Unit I. | Turkey | 160 | 2004 | Natural draft dry cooling tower (single tower for Unit I-II.), DC jet condenser, peak coolers |
| 73. | CAN 160 MW CFB based Thermal Power Station, Unit II. | Turkey | 160 | 2004 | Natural draft dry cooling tower (single tower for Unit I-II.), DC jet condenser, peak coolers |
| 74. | Vértes CHP Seasonal Cooler | Hungary | 18 | 2004 | Forced draft dry cooling tower |
| 75. | Sochi 72 MW CHP, Unit I. | Russia | 24 | 2004 | Induced draft steel structure dry cooling tower with supplementary spraying |
| 76. | Szentendre Power Station | Hungary | 10 | 2005 | Direct air cooled condenser, single row, all aluminum heat exchanger (SKYVE) |
| 77. | Dalmine CCPP, | Italy | 122 | 2006 | Dry section of hybrid dry/wet cooling tower |
| 78. | Levice CCGT CHP Plant | Slovakia | 80 | 2007 | Direct air cooled condenser, single row, all aluminum heat exchanger (SKYVE) |
| 79. | MMDC Moscow City 130 MW Town heating CCPP | Russia | 46 | 2008 | Forced draft steel structure dry cooling tower |
| 80. | Al Nasserieh 510 MW CCPP | Syria | 160 | 2008 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 81. | Modugno 800 MW CCPP | Italy | 300 | 2009 | Induced draft steel structure dry cooling tower, DC jet condenser |
| 82. | Deir Ali 750 MW CCPP | Syria | 250 | 2009 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 83. | Szakoly 20 MW Biomass Power Plant | Hungary | 20 | 2009 | Induced draft steel structure dry cooling tower, DC jet condenser |

## Dry and Dry/Wet Cooling Systems

| Ref. No. | Description | Country | Turbine Power (MW) | Commis-sioning | Remarks |
|---|---|---|---|---|---|
| 84. | Strogino 130 MW CCPP, Unit I. | Russia | 42 | 2009 | Induced draft steel structure dry cooling tower |
| 85. | Strogino 130 MW CCPP, Unit II. | Russia | 42 | 2009 | Induced draft steel structure dry cooling tower |
| 86. | Bao Ji 660 MW SC PP, Unit V. | China | 660 | 2010 | Natural draft dry cooling tower, DC jet condensers also serving the boiler feed pump turbines, FGD in tower |
| 87. | Sochi 72 MW CHP, Unit III. | Russia | 24 | 2010 | Induced draft steel structure dry cooling tower with supplementary spraying |
| 88. | Pervomaysk 180 MW PP, Unit I. | Russia | 66 | 2010 | Induced draft steel structure dry cooling tower |
| 89. | Pervomaysk 180 MW PP, Unit II. | Russia | 66 | 2010 | Induced draft steel structure dry cooling tower |
| 90. | Bao Ji 660 MW SC PP, Unit VI. | China | 660 | 2011 | Natural draft dry cooling tower, DC jet condensers also serving the boiler feed pump turbines, FGD in tower |
| 91. | Tereshkovo 340 MW, CHP PS | Russia | 70 | 2011 | Induced draft steel structure dry cooling tower |
| 92. | Shuidonggou 660 MW SC PP, Unit I. | China | 660 | 2011 | Natural draft dry cooling tower with supplementary spraying |
| 93. | Shuidonggou 660 MW SC PP, Unit II. | China | 660 | 2011 | Natural draft dry cooling tower with supplementary spraying |
| 94. | Shanyin 300 MW PP, Unit I. | China | 300 | 2012 | Natural draft dry cooling tower (single tower for Unit I &2), DC jet condensers also serving the boiler feed pump turbines, FGD in tower |
| 95. | Shanyin 300 MW PP, Unit II. | China | 300 | 2012 | Natural draft dry cooling tower (single tower for Unit I &2), DC jet condensers also serving the boiler feed pump turbines, FGD in tower |
| 96. | Adler 180 MW CCPP, Unit I. | Russia | 60 | 2013 | Induced draft steel structure dry cooling tower with supplementary spraying |
| 97. | Adler 180 MW CCPP, Unit II. | Russia | 60 | 2013 | Induced draft steel structure dry cooling tower with supplementary spraying |
| 98. | Novy Urengoy 120 MW CCPP | Russia | 40 | 2014 | Induced draft steel structure dry cooling tower |
| 99. | Deir Ali 750 MW CCPP, Unit II. | Syria | 250 | 2014 | Natural draft steel structure dry cooling tower, DC jet condenser |
| 100. | Jinchang 330 MW TPP, Unit I. | China | 330 | 2014 | Natural draft dry cooling tower with supplementary spraying |
| 101. | Jinchang 330 MW TPP, Unit II. | China | 330 | 2014 | Natural draft dry cooling tower with supplementary spraying |
| 102. | Tufanbeyli 150 MW TPP, Unit I. | Turkey | 150 | 2015 | Natural draft dry cooling tower (single tower for Unit I-II-III.), DC jet condenser, peak coolers, CFB gases exhausted via cooling tower |
| 103. | Tufanbeyli 150 MW TPP, Unit II. | Turkey | 150 | 2015 | Natural draft dry cooling tower (single tower for Unit I-II-III.), DC jet condenser, peak coolers, CFB gases exhausted via cooling tower |
| 104. | Kojuhovo 340 MW CHP PS | Russia | 70 | 2015 | Induced draft steel structure dry cooling tower |
| 105. | Tufanbeyli 150 MW TPP, Unit III. | Turkey | 150 | 2015 | Natural draft dry cooling tower (single tower for Unit I-II-III.), DC jet condenser, peak coolers, CFB gases exhausted via cooling tower |
| 106. | Shengle 350 MW Supercritical CHP TPP, Unit I. | China | 350 | 2015 | Natural draft dry cooling tower, FGD-in-tower |
| 107. | Hepo 350 MW Supercritical CHP TPP, Unit I. | China | 350 | 2015 | Natural draft dry cooling tower |
| 108. | Erdos 330 MW TPP, Unit I. | China | 330 | 2015 | Natural draft dry cooling tower, FGD-in-tower |

## Dry and Dry/Wet Cooling Systems

| Ref. No. | Description | Country | Turbine Power (MW) | Commis - sioning | Remarks |
|---|---|---|---|---|---|
| 109. | Erdos 330 MW TPP, Unit I. | China | 330 | 2015 | Natural draft dry cooling tower, FGD-in-tower |
| 110. | Erdos 330 MW TPP, Unit II. | China | 330 | 2015 | Natural draft dry cooling tower, FGD-in-tower |
| 111. | Shengle 350 MW Supercritical CHP TPP, Unit II. | China | 350 | 2016 | Natural draft dry cooling tower, FGD-in-tower |
| 112. | Hepo 350 MW Supercritical CHP TPP, Unit II. | China | 350 | 2016 | Natural draft dry cooling tower |
| 113. | Yinxing, 660 MW Ultra-supercritical CHP; Unit I. | China | 660 | 2016 | Natural draft dry cooling tower |
| 114. | Yinxing, 660 MW Ultra-supercritical CHP; Unit II. | China | 660 | 2016 | Natural draft dry cooling tower |
| 115. | Erdos 330 MW TPP, Unit III. | China | 330 | 2017 | Natural draft dry cooling tower, FGD-in-tower |
| 116. | Erdos 330 MW TPP, Unit IV. | China | 330 | 2017 | Natural draft dry cooling tower, FGD-in-tower |
| 117. | Shanyin II. 350 MW Supercritical TPP, Unit I | China | 350 | 2017 | Natural draft dry cooling tower (single tower for Unit I &2), FGD-in-tower |
| 118. | Shanyin II. 350 MW Supercritical TPP, Unit II | China | 350 | 2017 | Natural draft dry cooling tower (single tower for Unit I &2), FGD-in-tower |
| 119. | Hamitabat 600 MW CCPP, Unit I. | Turkey | 600 | 2017 | Natural draft dry cooling tower, DC jet condenser; the original cooling towers will serve the new CCPP units |
| 120. | Hamitabat 600 MW CCPP, Unit II | Turkey | 600 | 2017 | Natural draft dry cooling tower, DC jet condenser; the original cooling towers will serve the new CCPP units |
| 121. | Sakhalin 2×60 MW TPP | Russia | 120 | 2017 | Fan assisted natural draft steel structure dry cooling tower |
| 122. | Zaoquan, 660 MW Ultra-supercritical TPP; Unit I. | China | 660 | 2017 | Natural draft dry cooling tower, FGD-in-tower |
| 123. | Zaoquan, 660 MW Ultra-supercritical TPP; Unit II. | China | 660 | 2017 | Natural draft dry cooling tower, FGD-in-tower |
| 124. | Gaohe 660 MW Supercritical TPP, Unit I | China | 660 | 2017 | Natural draft dry cooling tower (single tower for Unit I &2) |
| 125. | Gaohe 660 MW Supercritical TPP, Unit II | China | 660 | 2017 | Natural draft dry cooling tower (single tower for Unit I &2) |
| 126. | Wujianfang, 660 MW Ultra-supercritical CHP; Unit I. | China | 660 | 2017 | Natural draft dry cooling tower |
| 127. | Wujianfang, 660 MW Ultra-supercritical CHP; Unit II. | China | 660 | 2017 | Natural draft dry cooling tower |
| 128. | Huaneng Guilin gas distribute energy | China | | 2017 | Induced draft plume abated concrete structure hybrid dry/wet cooling tower |
| 129. | Achinsk 2×12 MW TPP | Russia | 24 | 2018 | Induced draft steel structure dry cooling tower |
| 130. | Changle, 1000 MW Ultra-supercritical TPP; Unit I. | China | 1000 | 2019 | Natural draft dry cooling tower (IDCT) |
| 131. | Changle, 1000 MW Ultra-upercritical TPP; Unit II. | China | 1000 | 2019 | Natural draft dry cooling tower (IDCT) |
| 132. | Shanghai Shengneng Fengxian Power plant | China | 2x400 | 2019 | Induced draft plume abated concrete structure hybrid dry/wet cooling tower |
| 133. | Hangzhou Linjiang environmental energy | China | 3x45 | 2020 | Induced draft plume abated concrete structure hybrid dry/wet cooling tower |
| 134. | Amurskaya TPP (Svobodny TPP, Amurskaya region) | Russia | 2x80 | 2021 | Induced draft steel structure dry cooling tower |
| 135. | Amurskaya TPP (Svobodny TPP, Amurskaya region) | Russia | 2x80 | 2021 | Induced draft steel structure dry cooling tower |

## Dry and Dry/Wet Cooling Systems

| Ref. No. | Description | Country | Turbine Power (MW) | Commis - sioning | Remarks |
|---|---|---|---|---|---|
| 136. | Changcheng, 1000MW Ultra-supercritical TPP, Unit I. | China | 1000 | 2022 | Natural draft dry cooling tower (IDCT) |
| 137. | Changcheng, 1000MW Ultra-supercritical TPP, Unit II. | China | 1000 | 2022 | Natural draft dry cooling tower (IDCT) |
| 138. | Warsaw EfW | Poland | 25 | 2022 | Direct air cooled condenser, single row heat exchangers, Waste to Energy Plant |
| 139. | Avtovskaya TPP | Russia | 280 | 2022 | Induced draft steel structure dry cooling tower with supplementary spraying |
| 140. | Ruoqiang 2x350 MW | China | 700 | 2025 | Natural draft indirect dry cooling tower (IDCT) |
| 141. | Hetian 350 MW TPP, Unit I. | China | 350 | 2023 | Natural draft dry cooling tower (IDCT) |
| 142. | Hetian 350 MW TPP, Unit II. | China | 350 | 2023 | Natural draft dry cooling tower (IDCT) |
| 143. | Changle 3, 2x1000 MW Ultra-supercritical TPP; Unit III. | China | 2000 | 2025-26 | Natural draft dry cooling tower (IDCT) |
| 144. | Jingshan 3, 2x1000 MW | China | 2000 | 2025-26 | Natural draft indirect dry coling tower (IDCT) |
| 145. | Qiaotou 3x660 MW | China | 1980 | 2025-26 | Natural draft indirect dry coling tower (IDCT) |
| 146. | CGN Ali 2x25 MW | China | 50 | 2025 | Air-cooled condenser (ACC) |
| 147. | Erdos | China | 35 | 2025 | Air-cooled condenser (ACC) |

Natural draft dry cooling tower,
DC jet condenser
Mátra Power Station, Unit IV, Hungary

Natural draft steel structure dry cooling tower, DC jet condenser, peak coolers
Great Isfahan Power Station, Unit I-VII., Iran

Induced draft steel structure dry cooling tower
Tereshkovo, 340 MW CHP, Russia,

Induced draft steel cooling tower with supplementary spraying
Sochi CHP Unit 3.72 MW, Russia,

Direct air cooled condenser, single row, all aluminum heat exchanger
Levice CCGT CHP Plant, 80 MW, Slovakia, 2007

## 1.2 WET COOLING SYSTEMS

| Ref. No. | Description | Country | Water flow rate m3/h | Inlet/outlet water temp. °C/°C | Wet bulb temp./ relative humidity °C/% | Commis-sioning | App-roach °C | Remark |
|---|---|---|---|---|---|---|---|---|
| 1. | Cold Store, Győr | Hungary | 780 | 32/27 | 22/60 | 1986 | 5 | |
| 2. | Cold Store, Székesfehérvár | Hungary | 700 | 32/27 | 23/30 | 1986 | 4 | |
| 3. | Steel Work, Dunaújváros | Hungary | 2 500 | 42/27 | 19/50 | 1986 | 8 | Natural draft |
| 4. | Gas Storage, Pusztaederics | Hungary | 600 | 37/27 | 21/40 | 1987 | 6 | |
| 5. | Canning Factory, Nagyatád | Hungary | 850 | 40/27 | 18/50 | 1989 | 9 | Natural draft |
| 6. | Cold Store, Békéscsaba | Hungary | 1 170 | 30,6/25,6 | 20/40 | 1990 | 5,6 | |
| 7. | Cold Store, Dunakeszi | Hungary | 330 | 32/26 | 20/40 | 1990 | 6 | |
| 8. | Cold Store, Székesfehérvár | Hungary | 700 | 32/27 | 23/30 | 1991 | 4 | |
| 9. | Gas Storage, Pusztaederics | Hungary | 600 | 32/27 | 21/40 | 1991 | 6 | |
| 10. | Oxigen Works, Budapest | Hungary | 700 | 37/27 | 22/40 | 1991 | 5 | |
| 11. | Cold Store, Dunakeszi | Hungary | 330 | 32/26 | 20/40 | 1992 | 6 | |
| 12. | Mátra Power Plant, Visonta | Hungary | 6 x 600 | 38,5/28,5 | 20/40 | 1993 | 8,5 | |
| 13. | Mátra Power Plant, Visonta | Hungary | 600 | 38,5/28,5 | 20/40 | 1993 | 8,5 | |
| 14. | Mátra Power Plant, Visonta | Hungary | 12 x 600 | 38,5/28,5 | 20/40 | 1994 | 8,5 | |
| 15. | Coal Mine, Mecsek | Hungary | 200 | 40/30 | 22/40 | 1994 | 8 | |
| 16. | Mátra Power Plant, Visonta | Hungary | 6 x 600 | 38,5/28,5 | 20/40 | 1995 | 8,5 | |
| 17. | MOL Rt Gas Field, Algyő | Hungary | 500 | 32/25 | 22/40 | 1995 | 3 | |
| 18. | Mátra Power Plant, Visonta | Hungary | 9 x 600 | 38,5/28,5 | 20/40 | 1996 | 8,5 | |
| 19. | Mátra Power Plant, Visonta | Hungary | 9 x 600 | 38,5/28,5 | 20/40 | 1997 | 8,5 | |
| 20. | Pars Oil, Tehran | Iran | 550 | 45/28 | 24/28 | 1998 | 4 | Earthquake exposed area |
| 21. | Mátra Power Plant, Visonta | Hungary | 9 x 600 | 38,5/28,5 | 20/40 | 1998 | 8,5 | |
| 22. | MOL Rt Gas Field, Algyő | Hungary | 280 | 32/27 | 22/40 | 2000 | 5 | |
| 23. | Borsod Chemical Works | Hungary | 5 200 | 36/26 | 22/40 | 2001 | 4 | |
| 24. | Kispest Power Plant Seasonal Cooler | Hungary | 1695 | 75/38 | 21/37 | 2003 | 17 | |
| 25. | Kispest Power Plant Auxiliary Cooler | Hungary | 846 | 36,5/30,4 | 21/37 | 2003 | 9,4 | |
| 26. | Tiszaújváros Chemical Works Olefin-2 and HDPE-2 Plants | Hungary | 15400 | 38,4/25,5 | 21.5/65 | 2003 | 4.0 | |

## Wet Cooling Systems

| Ref. No. | Description | Country | Water flow rate $m^3/h$ | Inlet/outlet water temp. °C/°C | Wet bulb temp./ relative humidity °C/% | Commis-sioning | App-roach °C | Remark |
|---|---|---|---|---|---|---|---|---|
| 27. | Borsod Chemical Works, VCM Plant | Hungary | 2000 | 36/26 | 23/35 | 2004 | 3 | |
| 28. | Borsod Chemical Works, MDI Plant | Hungary | 6000 | 36/26 | 23/40 | 2004 | 3 | |
| 29. | Wet Cooling Tower for Linde Gas, Hyco II. | Hungary | 3400 | 38/26 | 22/40 | 2005 | 4 | |
| 30. | Borsod Chemical Works, Chlorine Plant | Hungary | 4000 | 36/26 | 23/40 | 2005 | 3 | |
| 31. | Hungrana, Szabadegyháza | Hungary | 1332 | 34/26 | 23/40 | 2005 | 3 | |
| 32. | Pét, Nitrogen Chemical Works | Hungary | 5 x 3000 | 36/26 | 21.6/30 | 2006 | 4.4 | |
| 33. | Matra PS - Performance enhancement of Unit IV and 5 for a four cell WTC | Hungary | 18000 | 47.3/31.3 | 20/40 | 2006/2007 | 11.3 | |
| 34. | Borsod Chemical Works, Concrete Structure Wet Cooling Tower for the MDI Plant, extension | Hungary | 3000 | 36/26 | 23/40 | 2007 | 3 | |
| 35. | Borsod Chemical Works, Cooling Tower for Hydrochloric Acid Plant | Hungary | 6000 | 37/27 | 23/40 | 2008 | 4 | |
| 36. | Wet cooling tower for Hungrana Bioetanol Unit | Hungary | 400 | 38/27 | 23/40 | 2010 | 4 | |
| 37. | Borsod Chemical Works, Cooling Tower for Nitric Acid Plant | Hungary | 6000 | 37/27 | 23/40 | 2012 | 4 | |
| 38. | Wet cooling tower for Linde Gas, Hyco III. | Hungary | 2200 | 38/28 | 22/38 | 2012 | 6 | |
| 39. | Wet cooling tower for Auxiliary Cooling of Tishreen 200MW PP Unit III | Syria | 2000 | 44/38 | 29.3/46 | 2013 | 8.7 | |
| 40. | Wet cooling tower for Auxiliary Cooling of Tishreen 200MW PP Unit IV | Syria | 2000 | 44/38 | 29.3/46 | 2013 | 8.7 | |
| 41. | Tiszaújváros Chemical Works Butadiene Plant | Hungary | 3000 | 36/25 | 21.5/65 | 2014 | 3.5 | |
| 42. | BorsodChem, MDI Plant | Hungary | 3000 | 36/26 | 23/40 | 2014 | 3 | Cooling fill refurbishment |
| 43. | TVK Chemical Works Olefine 2 & HDPE 2 Plant | Hungary | 15400 | 38.4/25.5 | 21.5/65 | 2015 | 4 | Cooling fill refurbishment |
| 44. | Pét, Nitrogen Chemical Works | Hungary | 3 x 2800 | 36/26 | 21.6/30 | 2016 | 4.4 | |
| 45. | Hamburger Hungária Kft., Dunaújváros | Hungary | 1 x 288 | 39/27 | 22/30 | 2017 | 5 | Extension cell |

## Wet Cooling Systems

| Ref. No. | Description | Country | Water flow rate m3/h | Inlet/outlet water temp. °C/°C | Wet bulb temp./ relative humidity °C/% | Year of Commis-sioning | App-roach °C | Remark |
|---|---|---|---|---|---|---|---|---|
| 46. | Ongropack Kft., Szirmabesenyő | Hungary | 600 | 29.4/26. | 23/33 | 2018 | 3 | |
| 47. | MPK Chemical Works Olefine 1 Plant | Hungary | 16000 | 40/25.5 | 21.5/65 | 2018 | 4 | Cooling fill refurbishment |
| 48. | Borsodchem Chemical Works Site IV | Hungary | 3 x 3000 | 38/28 | 23.5/38 | 2020 | 4.5 | Super Low noise design |
| 49. | Bonduelle Nagykőrös | Hungary | 60 | 50/33 | 23/40 | 2021 | 10 | Natural Draft CT refurbishment |
| 50. | Bonduelle Nyírszőlős | Hungary | 60 | 50/22 | 19/40 | 2022 | 3 | Low clogging fills |
| 51. | Polgár W2E Plant | Hungary | 600 | 43,5/36 | 24/40 | 2022 | 12 | Low clogging fills |
| 52. | Borsodchem Chemical Works, MDI1 Cooling Towers | Hungary | 3000 | 36/26 | 23/40 | 2022 | 3 | Wet tower refurbishment |
| 53. | MOL Petrolkémia (MPK) Olefin Conversion Unit | Hungary | 3400 | 36/25 | 21,55/65 | 2023 | 3,5 | Wet tower, filter & fire water system |
| 54. | Bonduelle Békéscsaba | Hungary | 60 | 70/24 | 21/59 | 2023 | 3 | Low clogging fills |
| 55. | Hengyi | China | 2x4000 | 43/33 | 29.0/65.5 | 2025 | 4 | MDCT WET, 2 small cells |
| 56. | Hengyi | China | 26x5000 | 43/33 | 29.0/65.5 | 2025 | 4 | MDCT WET, 26 big cells |

## 1.3 AUXILIARY & PROCESS AIR COOLERS

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 1. | Kirchdorf Cement Works<br>Induced draft lube oil cooling tower | Austria | 1962 | finned surface: 6000 sqm<br>cooler type: L-60 Forgo plate fin |
| 2. | Forced draft cooling deltas with fans and louvers | Hungary<br>Poland | 1960<br>1965 | total finned surface: 6000 sqm<br>cooler type: L-60 Forgo plate fin |
| 3. | Zala Oil Refinery<br>Induced draft water cooling tower | Hungary | 1964 | finned surface: 24 000 sqm<br>cooler type: L-60 Forgo plate fin |
| 4. | Moscow Oil Refinery<br>Induced draft water cooling tower with fans and louvers | Soviet Union | 1964 | finned surface: 72 000 sqm<br>cooler type: L-60 Forgo plate fin |
| 5. | Generator air coolers for hydro power plants, various sizes | Poland<br>India<br>Nepal | 1969<br>1978 | L-60 Forgo plate fin, copper alloy core tubes, removable c. steel headers, finned surface: 15 000 sqm |
| 6. | Borsod Chemical Works, Induced draft water cooling tower | Hungary | 1965 | cooler surface: 20 000 sqm |
| 7. | Katowice Steel Works<br>Forced draft water cooling towers, | Poland | 1966 | cooler surface: 8000 sqm<br>cooler type: L-60 Forgo plate fin |
| 8. | Transformer oil coolers with fans and accessories, turbulators in the tuber | Hungary | 1968<br>1976 | total surface: 10 000 sqm |
| 9. | Forced draft water cooling towers,<br>Duna Cement Works | Hungary | 1969-<br>1970 | cooler surface: 18 000 sqm<br>cooler type: L-60 Forgo plate fin |
| 10. | Miskolc Glass Works<br>Forced draft water cooler tower | Hungary | 1970 | cooler surface: 8000 sqm<br>all aluminum structure with welded tube ends |
| 11. | Forced draft lube oil coolers with control louvers and turbulators in the tuber | Soviet Union | 1973 | total cooler surface: 1 580 000 sqm |
| 12. | Forced draft water cooler for arc furnace, with demineralizer | Dubai | 1974 | cooler surface: 2000 sqm |
| 13. | Forced draft units for greenhouse heating, Kashira and Riga | Soviet Union | 1976<br>1986 | total cooler surface: 10 000 sqm |
| 14. | Induced draft lube oil coolers and turbulators in the tubes | Soviet Union | 1977 | cooler type: T-60 Forgo plate fin total cooler surface: 300 000 sqm |
| 15. | Induced draft lube oil coolers with louvers, turbulators in the tubers, electric heating and air recirculation | Soviet Union | 1977<br>1979 | total cooler surface: 5 470 000 sqm<br>cooler type:T-60 Forgo plate fin |
| 16. | Gödöllô Engineering Works<br>Forced draft water coolers for motor test facility | Hungary | 1978 | L-60 Forgo plate fin air coolers,<br>total surface: 10 000 sqm |
| 17. | Ostrava Steel Works<br>Forced draft oil coolers with control louvers | Czecho-slovakia | 1978 | cooler type: L-60 Forgo plate fin<br>total cooler surface: 41 000 sqm |
| 18. | Kardoskut Compressor Station<br>Forced draft water cooler tower with control louvers | Hungary | 1979 | cooler type: L-60 Forgo plate fin,<br>total cooler surface: 24 000 sqm |
| 19. | Urdoma Compressor Station<br>Induced draft natural gas coolers, | Soviet Union | 1979 | cooler type: T-60 Forgo plate fin<br>total cooler surface: 39 000 sqm |
| 20. | Vitkovice steel Works<br>Forced draft oil and water cooling tower | Czecho-slovakia | 1979 | cooler type: L-60 Forgo plate fin<br>total cooler surface: 31 000 sqm |
| 21. | Teplice Glass Works,<br>Induced draft water cooling tower with adjustable speed fan | Czecho-slovakia | 1980 | cooler type: T-60 Forgo plate fin,<br>total cooler surface: 31 000 sqm |

## Auxiliary & Process Air Coolers

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 22. | Algyô Oil Refinery, Replacement bundles for forced draft water cooling towers, | Hungary | 1980 | total cooler surface: 16 000 sqm |
| 23. | Beregdaróc Compressor Station, Induced draft natural gas coolers | Hungary | 1980 | steel core tube air coolers for 100 bar nominal pressure |
| 24. | Induced draft water cooling tower with adjustable speed fans, Teplice Glass Works | Czecho-slovakia | 1982 | cooler type: T-60 Forgo plate fin total cooler surface: 62 000 sqm |
| 25. | Algyô Oil Refinery, Induced draft gasoline condenser | Hungary | 1982 | steel core tube air cooler, T-60 Forgo, total cooler surface: 38 400 sqm |
| 26. | Algyô Oil Refinery, Forced draft residual oil cooler | Hungary | 1982 | steel core tube, extruded aluminum fin air cooler, total surface: 1500 sqm |
| 27. | | | | |
| 28. | Városföld Compressor Station, Induced draft natural gas coolers | Hungary | 1983 | steel core tube air coolers with T-60 Forgo type plate fins, total surface: 19 200 sqm |
| 29. | Induced draft water coolers with control | Czecho-slovakia | 1983 | total cooler surface: 16 000 sqm |
| 30. | Duna Cement Works, Induced draft water coolers with deluging system, | Hungary | 1984 | total cooler surface 10 000 sqm |
| 31. | Tiszaszederkény Compressor Station, Induced draft natural gas coolers | Hungary | 1984 | steel core tubes and T-60 Forgo plate fin, total surface: 38 400 sqm |
| 32. | Szank compressor Station, Induced draft gas and water coolers with control louvers | Hungary | 1984 | steel core tube, steel fin galvanized air coolers, total surface: 4000 sqm |
| 33. | Isfahan Power Station, Auxiliary water coolers and water, spraying system, | Iran | 1984 1986 | T-60 Forgo plate fin air coolers, total surface: 192 000 sqm |
| 34. | Algyô Compressor Station, Induced draft gas and water coolers with control louvers | Hungary | 1985 | steel core tube, steel fin galvanized air coolers, total surface: 4000 sqm |
| 35. | Oroszlány Power Station, Replacement bundles for generators, | Hungary | 1986 | copper alloy core tuber and aluminum plate fins, total surface: 2000 sqm |
| 36. | Forced draft air coolers for various products, Duna Oil Refinery | Hungary | 1986 | extruded aluminum fin air coolers, total surface: 10 000 sqm |
| 37. | Szank Compressor Station, Induced draft coolers for natural gas (CHS) and jacket water cooling with control louvers | Hungary | 1986 | extruded aluminum fin air coolers, total surface: 5000 sqm |
| 38. | Induced draft water coolers with electric heating and control louvers for chemical plants | Soviet Union | 1986 | T-60 Forgo plate fin coolers, total surface: 16 000 sqm |
| 39. | Induced draft lube oil coolers with electric heating, control louvers and air recirculation | Soviet Union | 1986 | T-60 Forgo plate fin aluminum air coolers, total surface: 1 086 000 sqm |
| 40. | Trakya Combined Cycle Power Plant, Unit A-B, Induced draft auxiliary water coolers and deluging system, | Turkey | 1986 1987 | steel core tube, T-60 Forgo plate fin coolers, total surface: 24 000 sqm |
| 41. | Replacement bundles for natural gas and pentane coolers | Hungary | 1987 | extruded aluminum fins wit steel core tubes, total surface: 2000 sqm |
| 42. | Budapest, Induced draft water cooling tower for nuclear test reactor | Hungary | 1987 | T-60 Forgo plate fin air coolers, total surface: 76 800 sqm |
| 43. | Algyô Compressor Station, Induced draft coolers for natural gas (CHS) and jacket water cooling with control louvers | Hungary | 1987 | extruded aluminum fin air coolers, total surface: 5000 sqm |
| 44. | Rossendorf nuclear test reactor Induced draft water cooling tower with adjustable speed fans and control louvers | Germany | 1987 | T-60 Forgo plate fin aluminum coolers, total surface: 32 000 sqm |
| 45. | Hajdúszoboszló Compressor Station, Forced draft natural gas and water coolers, with control louvers | Hungary | 1987 | extruded aluminum fin and steel core tube air coolers for 120 bar nominal pressure, total surface: 4000 sqm |

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 46. | Induced draft lube oil coolers with electric heating, louvers and air recirculation | Soviet Union | 1987 | T-60 Forgo plate fin coolers with turbulators, total surface: 2 500 000 sqm |
| 47. | Kardoskút Compressor Station, Compressed air cooler | Hungary | 1987 | copper alloy core tubes and alu fins, total surface: 200 sqm |
| 48. | Battonya Compressor Station, Forced draft natural gas and water cooler | Hungary | 1987 | galvanized steel tube and steel finm, air cooler, total surface: 500 sqm |

## Auxiliary & Process Air Coolers

| | | | | |
|---|---|---|---|---|
| 49. | Trakya Combined Cycle Power Plant, Unit C.,D, Induced draft auxiliary water coolers and deluging system | Turkey | 1988 | steel core tube, T-60 Forgo plate fin, coolers, total surface: 24 000 sqm |
| 50. | Shahid Rajai Power Station, Induced draft auxiliary water coolers with deluging system | Iran | 1988 1989 | resin coated T-60 Forgo aluminum, air coolers, total surface: 72 000 sqm |
| 51. | Hajduszoboszló Compressor Station, Forced draft natural gas and water cooler with control louvers | Hungary | 1990 | extruded aluminum fin and steel core tube air coolers total surface: 20 000 sqm |
| 52. | Shahid Rajai Power Station, Induced draft auxiliary water coolers with deluging system | Iran | 1991 | resin coated T-60 Forgo aluminum, air coolers, total surface: 72 000 sqm |
| 53. | Induced draft lube oil coolers with electric heating control louvers and recirculation | Russia | 1991 | T-60 Forgo aluminum air coolers with turbulators total surface: 45 000 sqm |
| 54. | Induced draft lube oil coolers with electric heating, control louvers and recirculation | Russia | 1992 1993 | T-60 Forgo aluminum air coolers with turbulators, total surface: 45 000 sqm |
| 55. | Sugar Factory, Kaposvár, Forced draft generator cooler bundles | Hungary | 1993 | T-60 Forgo aluminum air coolers, total surface: 540 sqm |
| 56. | Erbeek, Forced draft auxiliary water coolers with deluging system | The Nether-lands | 1993 | Resin coated T-60 Forgo aluminum air coolers, total surface: 14 400 sqm |
| 57. | Neil Simpson Station Unit II. Induced draft auxiliary water coolers with deluging system | USA | 1994 | resin coated T-60 Forgo aluminum, air coolers with carbon steel insert tubes, extremely cold climate, total surface: 11 520 sqm |
| 58. | Zsana Underground Gas Storage, Forced draft gas coolers | Hungary | 1994 | extruded aluminum fin and stainless steel core tube air cooler, design pressure: 144 bar, design temperature: 160°C |
| 59. | Zsana Underground Storage, Forced draft auxiliary glycol-water coolers and cooling system | Hungary | 1994 | extruded aluminum fins and steel core, tube air cooler total surface: 3 X 2 200 sqm |
| 60. | Forced draft methanol condenser | Hungary | 1994 | Extruded aluminum fin and steel core, tube air cooler, total surface: 1140 sqm |
| 61. | Induced draft lube oil coolers with electric heating control louvers and recirculation | Argentina | 1994 | T-60 Forgo aluminum air, coolers with turbulators, total surface: 1920 sqm |
| 62. | Induced draft lube oil coolers with electric heating, control louvers and recirculation | Russia | 1994 | T-60 Forgo aluminum air coolers with turbulators total surface: 4 X 1920 sqm |
| 63. | Spare parts of oil coolers | Uzbegistan | 1995 | T-60 Forgo aluminum air cooler with turbulators, total surface: 9600 sqm |
| 64. | Spare parts of oil coolers | Ukraine | 1995 1996 | T-60 Forgo air cooler with aluminum fins, tubes and turbulators, total surface: 31 700 sqm |
| 65. | Paks Nuclear Station Unit I.-II., Cooler for the pump house of emergency feed-water system | Hungary | 1996 | T-60 Forgo aluminum air coolers with stainless steel tubes and tube sheets total air side surface: 4 X 60 sqm |
| 66. | OVIT Transmission Co. Ltd. Transformer oil cooler (100KW) | Hungary | 1996 | T-60 Forgo aluminum air coolers with stainless steel tubes and tube sheets, total air side surface: 10 X 140 sqm |
| 67. | Brugge CCPP, Induced draft auxiliary oil cooler | Belgium | 1996 | T-60 Forgo air cooler with aluminum, fins and copper tubes, total air side surface: 5184 sqm |
| 68. | Paks Nuclear Station Unit III.-IV., Cooler for the pump house of emergency feed-water system | Hungary | 1997 | T-60 Forgo aluminum air coolers with stainless steel tubes and tube sheets total air side surface: 4 X 60 sqm |

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 69. | RMVA Köln, Induced draft auxiliary water cooler | Germany | 1997 | T-60 Forgo air cooler with aluminum fins, carbon steel tubes, total air side surface: 13 824 sqm |
| 70. | Algyő Forced draft hydrocarbon product condenser refurbishment | Hungary | 1998 | extruded aluminum fin tubes, total air side surface: 40 700 sqm |
| 71. | Nemesbikk Induced draft high pressure natural gas cooler | Hungary | 1998 | extruded aluminum fins, steel core tubes, total air side surface: 11 500 sqm |
| 72. | Százhalombatta Forced draft hydrocarbon product condensers and coolers | Hungary | 1998 | extruded and embedded aluminum fins, steel core tubes, total air side surface: 39 100 sqm |
| 73. | Bursa 1400 MWe CCPP Induced draft auxiliary water coolers with deluging system | Turkey | 1999 | TA-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes, total air side surface: 61 500 sqm |
| 74. | Virginia Power Company Remington P. P.Induced draft gas turbine water coolers | USA | 1999 | TA-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes, total air side surface: 48 000 sqm |
| 75. | Florida Power Corporation Intercession City Forced draft gas turbine water coolers | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes, total air side surface: 21 600 sqm |

## Auxiliary & Process Air Coolers

| | | | | |
|---|---|---|---|---|
| 76. | Tennessee Valley Authority Lagoon Creek Forced draft gas turbine water coolers | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 38 400 sqm |
| 77. | SEI#-4, Michigan Forced draft gas turbine water coolers | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 19 200 sqm |
| 78. | Ray Olinger, Texas Forced draft gas turbine water cooler | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 3 600 sqm |
| 79. | Doswell, Virginia Forced draft gas turbine water cooler | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 14 400 sqm |
| 80. | Virginia Power Company Ladysmith P. P. Induced draft gas turbine water coolers | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 24 000 sqm |
| 81. | West Phoenix Power Plant Arizona Forced draft gas turbine water cooler | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface:2 400 sqm |
| 82. | ECAR Power Project Ceredo, West Virginia Forced draft gas turbine water cooler | USA | 2000 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface:14 400 sqm |
| 83. | Gebze 2 x 770 MWe CCPP Forced draft auxiliary water coolers | Turkey | 2001 | TA-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 115 200 sqm |
| 84. | Adapazari 770 MWe CCPP Forced draft auxiliary water coolers | Turkey | 2001 | TA-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 57 600 sqm |
| 85. | Tristate Brighton Forced draft gas turbine water coolers, | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 9 600 sqm |
| 86. | Tristate Limon Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 9 600 sqm |
| 87. | Linden 07Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 14 400 sqm |
| 88. | First Energy Sumpter Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 19 200 sqm |
| 89. | SEI Mobil Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 9 600 sqm |

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 90. | Dominion (Pleasants)Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 28 800 sqm |
| 91. | Platte River Plant Unit A Arizona Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface:2 400 sqm |
| 92. | Dominion (Troy)Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 57 600 sqm |
| 93. | Forced draft gas turbine water | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes<br>total air side surface: 57 600 sqm |
| 94. | Wygen Station 1, Unit III.Induced draft auxiliary water coolers with deluging system | USA | 2001 | resin coated T-60 Forgo aluminum air coolers with carbon steel insert tubes, extremely cold climate, total surface: 11 700 sqm |
| 95. | Tennessee Valley Authority Lagoon Creek II Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 19 200 sqm |
| 96. | Tennessee Valley Authority Kemper Forced draft gas turbine water coolers | USA | 2001 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 19 200 sqm |
| 97. | Platte River Plant Unit B&C Arizona Forced draft gas turbine water cooler | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface:4 800 sqm |
| 98. | Williams~Memphis Refinery Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 4 800 sqm |
| 99. | Morristown Tennessee Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 14 400 sqm |

## Auxiliary & Process Air Coolers

| | | | | |
|---|---|---|---|---|
| 100. | Mirant Portage County Ohio Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes, |
| 101. | Colbun Nehuenco Forced draft gas turbine water coolers | Chile | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>otal air side surface: 14 400 sqm |
| 102. | FPL Energy Fort Myers, Florida Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 28 800 sqm |
| 103. | Calhoun Power Co. Calhoun, Alabama Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 57 600 sqm |
| 104. | Blue Spruce Energy Center Aurora, Colorado Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 43 200 sqm |
| 105. | Southern Illionis Power Co. Marion Station, Illionis Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 9 600 sqm |
| 106. | WSP Resources Co. Pulliam, Wisconsin Forced draft gas turbine water coolers, | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes,<br>total air side surface: 4 800 sqm |
| 107. | Kansas City Power & Light. West Gardner, Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes |
| 108. | Kansas City Power & Light. Paola, Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes |
| 109. | Rainey Generation Santee Cooper,South Carolina Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes |
| 110. | Corn Belt / Basin Electric Wisdom Iowa Forced draft gas turbine water coolers | USA | 2002 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes |

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 111. | Spalding CCPP; Bechtel Co./Intergen Forced draft auxiliary water coolers<br>Low noise design | Great Britain | 2002 | T-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 101 400 sqm |
| 112. | Hitachi GT-s, LNG plant, Damietta Forced draft auxiliary oil cooler | Egypt | 2003 | TA-60 Forgo air cooler with aluminum fins and stainless steel tubes |
| 113. | GEA Luftkühler; MOL GOK-3 Hydrocarbon products condenser and cooler tube bundles | Hungary | 2003 | extruded and embedded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 65 150 sqm |
| 114. | GEA Luftkühler; PCK Hydrocarbon products cooler tube bundles | Germany | 2003 | extruded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 26 300 sqm |
| 115. | DOOSAN Co., Rehab Power Plant Induced draft gas turbine water coolers, | Jordan | 2004 | T-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 9 400 sqm |
| 116. | Sakhalin II. Onshore Processing Facility Project, Induced draft auxiliary oil cooler | Russia | 2004 | TA-60 Forgo air cooler with aluminum plate fins and tubes, with turbulator<br>total air side surface: 14 040 sqm |
| 117. | OTF; MOL-BEK 5 Forced draft hydrocarbon product condensers and coolers | Hungary | 2004 | extruded and embedded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 38 600 sqm |
| 118. | GEA Luftkühler; BAMAG Hydrocarbon products cooler tube bundles | Germany | 2004 | wrap-on aluminum fins, stainless steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 11 000 sqm |
| 119. | GEA Luftkühler; Shin Etsu Hydrocarbon products cooler tube bundles | Germany | 2004 | embedded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 47 200 sqm |
| 120. | GEA Luftkühler; Erfurt Hydrocarbon products cooler tube bundles | Germany | 2004 | extruded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 11 600 sqm |
| 121. | GEA Luftkühler; Shell & DEA Hydrocarbon products cooler tube bundles | Germany | 2004 | wrap-on aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 13 200 sqm |
| 122. | GEA Luftkühler; Alstom Hydrocarbon products cooler tube bundles | Latvia | 2004 | extruded and wrap-on aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections;<br>total air side surface: 49 200 sqm |
| 123. | GEA Luftkühler; NETRA Hydrocarbon products cooler tube bundles | Germany | 2004 | extruded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections,<br>total air side surface: 45 200 sqm |
| 124. | GEA Luftkühler; MAN Hydrocarbon products cooler tube bundles | Germany | 2004 | extruded aluminum fins, steel core tubes, expanded tube to tube sheet connections, |

## Auxiliary & Process Air Coolers

| | | | | |
|---|---|---|---|---|
| | | | | total air side surface: 15 800 sqm |
| 125. | GEA Luftkühler; OMV Hydrocarbon products cooler tube bundles | Austria | 2004 | extruded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections, total air side surface: 27 300 sqm |
| 126. | GEA Luftkühler; Linde Hydrocarbon products cooler tube bundles | Ukraine | 2004 | embedded aluminum fins, steel core tubes, expanded tube to tube sheet connections, total air side surface: 12 200 sqm |
| 127. | GEA Luftkühler; BAMAG Hydrocarbon products cooler tube bundles | Germany | 2004 | wrap-on aluminum fins, stainless steel core tubes, welded and expanded tube to tube sheet connections total air side surface: 5 500 sqm |
| 128. | GEA Luftkühler; Tebodin Hydrocarbon products cooler tube bundles | Germany | 2004 | embedded aluminum fins, stainless steel core tubes, welded and expanded tube to tube sheet connections stainless steel headers, total air side surface: 10 900 sqm |
| 129. | GEA Luftkühler; Plock Hydrocarbon products cooler tube bundles | Poland | 2005 | embedded aluminum fins, steel core tubes, welded and expanded tube to tube sheet connections, total air side surface: 30 900 sqm |

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 130. | Zsana Underground Gas Storage Forced draft gas coolers | Hungary | 2005 | extruded aluminum fin and stainless steel core tube air cooler, design pressure: 144 bar, design temperature: 160°C , total air side surface: 9 100 sqm |
| 131. | GEA Luftkühler; Saarstahl Water cooler tube bundles | Germany | 2005 | embedded aluminum fins, steel core tubes, welded tube to tube sheet connections total air side surface: 22 300 sqm |
| 132. | GEA Luftkühler; Perstorp Water cooler tube bundles | Sweden | 2005 | L-footed aluminum fins, steel core tubes, welded tube to tube sheet connections total air side surface: 22 700 sqm |
| 133. | Algyő Underground Gas Storage Forced draft gas coolers | Hungary | 2005 | extruded aluminum fin and stainless steel core tube air cooler, total air side surface: 10 160 sqm |
| 134. | Al Nasserieh 510 MWe CCPP Forced draft auxiliary water coolers | Syria | 2006 | TA-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes, total air side surface: 28 000 sqm |
| 135. | Zayzoun 510 MWe CCPP Forced draft auxiliary water coolers | Syria | 2006 | TA-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes, total air side surface: 28 000 sqm |
| 136. | MOL (Hungarian Oil Company), Beregdaróc Induced draft gas turbine glycol-water coolers | Hungary | 2006 | TA-67 Forgo air cooler with aluminium plate fins and steel core tubes, total air side surface: 1 150 sqm |
| 137. | Beregdaróc, Induced draft high pressure natural gas cooler | Hungary | 2006 | TA-67 Forgo air cooler with aluminium plate fins and steel core tubes, total air side surface: 27 000 sqm |
| 138. | Beregdaróc, High pressure natural gas cooler retrofit (changing of extruded finned tubes to TA67 finned tube bundle) | Hungary | 2006 | TA-67 aluminium fins, steel core tubes, total air side surface: 27 000 sqm |
| 139. | Hajdúszoboszló, Induced draft high pressure natural gas cooler | Hungary | 2006 | TA-67 aluminum fins, steel core tubes, total air side surface: 20 250 sqm |
| 140. | Wygen Station 2, Unit IV. Induced draft auxiliary water coolers with deluging system | USA | 2006 | resin coated T-60 Forgo aluminum air coolers with carbon steel insert tubes, extremely cold climate, total surface: 11 700 sqm |
| 141. | Polk Power Station, Florida Forced draft auxiliary water cooler | USA | 2006 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes, total air side surface: 18 716 sqm |
| 142. | MMDC Moscow City 130 MWe Town heating CCPPForced draft auxiliary water coolers | Russia | 2007 | TA-67 Forgo air cooler with aluminum plate fins and steel core tubes, total air side surface: 36 800 sqm |
| 143. | Modugno CCPP Auxiliary Cooler | Italy | 2008 | TA-60Forgo air cooler with aluminum plate fins and steel core tube, total air side surface: 76 800 sqm |
| 144. | Wygen Station 3, Unit V. Induced draft auxiliary water coolers with deluging system | USA | 2008 | resin coated T-60 Forgo aluminum air coolers with carbon steel insert tubes, extremely cold climate, total surface: 23 400 sqm |
| 145. | Virginia Power Company Ladysmith P. P. Unit III-4 and Unit V Induced draft gas turbine water coolers, | USA | 2008 | TA-60 Forgo air cooler with aluminum plate fins and steel tubes, total air side surface: 36 000 sqm |
| 146. | Tereshkovo Power Station Induced draft auxiliary-glycol water coolers with deluging system | Russia | 2009 | resin coated T-60 Forgo aluminum air coolers with carbon steel insert tubes, total surface: 38 400 sqm |
| 147. | Kojuhovo Power Station Induced draft auxiliary-glycol water coolers with deluging system | Russia | 2009 | resin coated T-60 Forgo aluminum air coolers with carbon steel insert tubes, total surface: 38 400 sqm |

## Auxiliary & Process Air Coolers

| | | | | |
|---|---|---|---|---|
| 148. | Tube bundles for corn dryer plant | Hungary | 2010 | T-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 3 000 sqm |
| 149. | XKK Kazakhstan oil field project Induced draft auxiliary oil cooler | Kazakhstan | 2010 | TA-60 Forgo air cooler with aluminum plate fins and tubes, with turbulator<br>total air side surface: 14 040 sqm |

| Ref. No. | Description | Country | Commis-sioning | Remarks |
|---|---|---|---|---|
| 150. | Sochi III, Induced draft auxiliary water coolers with deluging system | Russia | 2010 | T-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 15 600 sqm |
| 151. | Brunswick County Power Station Dominion Induced draft auxiliary water glycol cooler with deluging system | USA | 2013 | T-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 140 000 sqm |
| 152. | Fortum, Loviisa Nuclear Power Plant Forced draft emergency water cooler | Finland | 2013 | TA-60 Forgo air cooler with aluminum plate fins and stainless steel tubes,<br>total air side surface: 39 800 sqm |
| 153. | Centralnaya Power Station, Saint Petersburg Induced draft auxiliary water glycol cooler with deluging system | Russia | 2014 | T-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 23 400 sqm |
| 154. | Greensville County Power Station, Dominion Induced draft auxiliary water glycol cooler with deluging system | USA | 2015 | T-60 Forgo air cooler with aluminum plate fins, tubes and steel core tubes,<br>total air side surface: 140 000 sqm |
| 155. | Gösgen Nuclear Power Plant, Natural draft emergency water cooler | Switzer-land | 2016 | TA-60 Forgo air cooler with aluminum plate fins and stainless steel tubes, |
| 156. | Avtovskaya TPP-15 AC, St. Petersburg Induced draft peak auxiliary water cooler with deluging system | Russia | 2022 | T-60 Forgo air cooler with aluminum plate fins and tubes,<br>total air side surface sqm 65 000 |
| 157. | MIFŰ, Miskolc CCPP Forced draft water cooler for excess heat rejection units | Hungary | 2022 | TA-60 Forgo air cooler with aluminum plate fins and stainless steel tubes,<br>total air side surface sqm 10 000 |

# 2. POWER ENGINEERING & PROCESS TECHNOLOGY

## 2.1 CONVENTIONAL HEAT PRODUCTION - BOILER AND HEATING PLANTS

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 1. | Boiler plant, Óbuda | Hungary | 1970 | 2x6 t/h, 2,50 Gcal/h, 150/70 °C 1x100 Gcal/h, 150/70 °C n. gas |
| 2. | Boiler plant, Benatky | Czechoslovakia | 1970 | 3x10 t/h 10 bar oil |
| 3. | Boiler plant, Blankenburg | Germany | 1971 | 3x10 t/h 12 bar oil |
| 4. | Boiler plant, Zugló | Hungary | 1971 | 2x6 t/h 3x50 Gcal/h, 150/70 °C n. gas |
| 5. | Boiler plant, Újpalota | Hungary | 1971 | 2x6 t/h 3x50 Gcal/h, 150/70 °C n. gas |
| 6. | Extension of boiler plant, Debrecen | Hungary | 1974 | 3x50 Gcal/h 150/70 °C oil or n. gas |
| 7. | Boiler plant, Branderburg | Germany | 1975 | 3x12 t/h, 12 bar oil |
| 8. | District Heating plant, Észak-Buda | Hungary | 1977<br>1979<br>1977 | 2,6 t/h 1x50 Gcal/h, 150/70 °C 2x50 Gcal/h, 150/70 °C 2x 10.000 $m^3$ storage tank oil or n. gas oil |
| 9. | Boiler plant, Pesterzsébet | Hungary | 1977 | 2x50 Gcal/h, 150/70 °C oil or n. gas |
| 10. | Boiler plant, Pesterzsébet | Hungary | 1977 | 4x 6 t/h, 1x50 Gcal/h, 150/70 °C n. gas |
| 11. | Boiler reconstruction, cogeneration plant, Halle | Germany | 1981 | 3x125 t/h 102 bar/525 °C n. gas |
| 12. | Extension of boiler plant, Szekszárd | Hungary | 1982 | 2x35 Gcal/h 150/70 °C oil |
| 13. | Extension of boiler plant, Alkaloida Works, Tiszavasvári | Hungary | 1982 | 50 t/h 38 bar/420 °C oil |
| 14. | Heat transfer oil boiler plant, Forestry, Szombathely | Hungary | 1982 | 1.6 Gcal/h 285 °C oil |
| 15. | Boiler reconstruction, cogeneration plant, Premnitz | Germany | 1983 | 2x125 t/h 102 bar/525 °C oil or inert gas |
| 16. | Boiler reconstruction, Dresden | Germany | 1983 | 4x10 t/h 12 bar/525 °C n.gas oil or |

## Conventional Heat Production - Boiler and Heating Plants

| Ref. No. | Description | Country | Year | Remarks | |
|---|---|---|---|---|---|
| 17. | Boiler reconstruction, Elsterwerda | Germany | 1983 | 3x10 t/h<br>12 bar | n. gas |
| 18. | Boiler plant,<br>Mosonmagyaróvár | Hungary | 1983 | 3x4 t/h<br>12 bar | coal |
| 19. | Extension of district heating plant,<br>Debrecen | Hungary | 1983 | 2x50 t/h<br>38 bar/420 °C<br>1x100 Gcal/h<br>150/70 °C | oil or<br>n.gas |
| 20. | Boiler reconstruction,<br>cogeneration plant, Halle | Germany | 1984 | 2x100 Gcal/h | oil or<br>inert<br>gas or<br>n.gas |
| 21. | Extension of boiler plant,<br>Kőbánya Brewery | Hungary | 1986 | 50 t/h<br>38 bar/420 °C | n. gas |
| 22. | Extension boiler plant,<br>Hodsusa Hamre | Czechoslovakia | 1986 | 12 t/h<br>8 bar | n. gas |
| 23. | Extension boiler plant,<br>Banska Stiavnica | Czechoslovakia | 1987 | 7 t/h<br>8 bar | n. gas |
| 24. | Boiler plant,<br>Pesterzsébet Paper Works | Hungary | 1988 | 12 t/h | n.gas |
| 25. | District Heating Plant<br>Csepel | Hungary | 1988 | 10 t/h<br>16 bar/240 °C | sunflower<br>seed shell |
| 26. | Boiler plant, AGROFERM | Hungary | 1989 | 2x2.8 t/h | oil |
| 27. | Boiler plant,<br>Ball Bearing Works, Debrecen | Hungary | 1989 | 3x12 t/h | n.gas |
| 28. | Boiler plant,<br>Ball Bearing Works, Diósd | Hungary | 1989 | 3x12 t/h | n.gas |
| 29. | Boiler plant,<br>HAGE, Kaba | Hungary | 1990 | 4x20 t/h<br>2x23 t/h | oil or<br>n. gas |
| 30. | Boiler plant, Szentendre Paper Works | Hungary | 1990 | 16 t/h | oil |
| 31. | Extension of boiler plant,<br>Behovice | Czechoslovakia | 1990 | 25 t/h<br>37 bar/450 °C | n. gas |
| 32. | Boiler plant,<br>Znojmo Canning Works | Czechoslovakia | 1990 | 2x20 t/h<br>1x16 t/h<br>16 bar/230 °C | n. gas<br>oil or<br>n. gas |
| 33. | Boiler plant,<br>Dunaújváros Steel Works | Hungary | 1990 | 100 t/h<br>42 bar/450 °C | oil<br>n. gas<br>Furnace<br>gas or<br>chamber<br>gas |

## Conventional Heat Production - Boiler and Heating Plants

| Ref. No. | Description | Country | Year | Remarks | |
|---|---|---|---|---|---|
| 34. | Boiler plant, Dunaújváros Steel Works | Hungary | 1991 | 100 t/h 42 bar/450 °C | |
| 35. | Boiler plant reconstruction, Dunaferr Steel Works | Hungary | 1994 | 75 t/h 46 bar/450 °C | n. gas<br>oil<br>furnace gas or chamber gas |
| 36. | Boiler plant reconstruction, Dunaferr Steel Works | Hungary | 1995 | 75 t/h 46 bar/450 °C | n. gas<br>oil<br>furnace gas or chamber gas |
| 37. | Boiler plant, Planetárium Budapest | Hungary | 2003 | | n.gas |
| 38. | Boiler plant reconstruction Debrecen, Power Plant | Hungary | 2004 | | circulation pump installation |
| 39. | Boiler plant reconstruction Nyíregyháza, Power Plant | Hungary | 2005 | | N°9, N°10 n.gas fired boilers reconstruction |

## 2.2 CONVENTIONAL HEAT PRODUCTION - POWER AND HEATING PLANTS

| Ref. No. | Description | Country | Year | Remarks | | |
|---|---|---|---|---|---|---|
| 1. | Extension of cogeneration plant, Mosonmagyaróvár Alumina Works | Hungary | 1952 | 7 x 212 t/h 12 bar/310 °C | | coal |
| 2. | Power station Marosújvár Soda Works | Rumania | 1954 | 3 x 50 t/h, 8,2 MW 40 bar/430 °C | n.gas | |
| 3. | Power stations (several units) | China | 1954-56 | 10t/h, 0,4 to 1,5 MW (each) 22 bar/390 °C | coal | |
| 4. | Cogeneration plant, Budapest, Textile Works | Hungary | 1955 | 18+14 t/h, 1,6 MW 29 bar/390 °C | coal | |
| 5. | Cogeneration plant, Nyergesújfalu, Chemical Works | Hungary | 1957 | 20 t/h, 0,7 MW 17 bar/350 °C | coal | |
| 6. | Cogeneration plant, Nagykanizsa Brewery | Hungary | 1957 | 20t/h, 0,2 MW 23 bar/390 °C | coal | |
| 7. | Cogeneration plant, Hungarian Chemical Works | Hungary | 1958 | 2x14 t/h, 2,8 MW 41 bar/450 °C | coal | |
| 8. | Extension of Wang Ting Power Station | China | 1958 | 120 t/h, 25 MW 37 bar/450 °C | coal | |
| 9. | Cogeneration plant, Hida Coal-cake Works | Hungary | 1960 | 2x14 t/h, 2,1 MW 37 bar/450 °C | coal | |
| 10. | Cogeneration plant, Csepel Paper Works | Hungary | 1960 | 2x50 t/h, 12,6 MW 116 bar/500 °C | | coal |
| 11. | Cogeneration plant, United Pharmaceutical Works | Hungary | 1960 | 2x14 t/h, 2 MW 41 bar/450 °C | coal | |
| 12. | Cogeneration plant, Budapest, Distillation Works | Hungary | 1961 | 52 t/h, 4,5 MW 41 bar/450 °C | coal | |
| 13. | Power Station Csepel Works | Hungary | 1961 | 48 t/h, 4,6 MW 41 bar/450 °C | coal | |
| 14. | Cogeneration plant extension, Kőbánya Brewery | Hungary | 1961 | 2x24 t/h, 4,5 MW 41 bar/450 °C | coal | |
| 15. | Cogeneration plant, Mohács Wood-fibred Works | Hungary | 1961 | 2x22 t/h, 1,8 MW 40 bar/450° C | coal | |
| 16. | Cogeneration plant, Kispest | Hungary | 1961 | 2x50 t/h, 12,6 MW 116 bar/500 °C | | coal |
| 17. | Cogeneration plant, Sopron | Hungary | 1962 | 2x16 t/h, 4,4 MW 31 bar/390 °C | coal | |
| 18. | Cogeneration plant, Hungarian Wool Works, Budapest | Hungary | 1962 | 21 t/h, 0,8 MW 23 bar/380 °C | coal | |
| 19. | Cogeneration plant, Nitrochemical Works, Fűzfő | Hungary | 1962 | 2x25 t/h, 4,5 MW 41 bar/450 °C | coal | |

## Conventional Heat Production - Power and Heating Plants

| Ref. No. | Description | Country | Year | Remarks | | |
|---|---|---|---|---|---|---|
| 20. | Power Station, Tanh-Hoa | Vietnam | 1962 | 2x10 t/h, 2x1,5 MW 22 bar/390 °C | coal | |
| 21. | Power Station, Tura | India | 1962 | 2x18 t/h, 2x1,5 MW 37 bar/400 °C | coal | |
| 22. | Power Station, Lasi | Rumania | 1963 | 3x120 t/h, 2x28 MW 101 bar/540 °C | | oil or n. gas |
| 23. | Cogeneration plant, Szolnok Paper Factory | Hungary | 1964 | 24 t/h, 2,5 MW 41 bar/450 °C | coal | |
| 24. | Cogeneration plant, Kőbánya | Hungary | 1964 | 4x50 t/h, 2x12,7 MW, 1x2,1 MW 116 bar/500 °C | | oil or n. gas |
| 25. | Cogeneration plant, LANG Engineering Works | Hungary | 1964 | 2x33 t/h, 10,6 MW, 41 bar/450 °C | coal | |
| 26. | Power Station, Site not disclosed | Vietnam | 1964 | 2x25 t/h, 2x4,5 MW, 41 bar/450 °C | coal | |
| 27. | Extension of cogeneration plant, Kőbánya | Hungary | 1965 | 2x50 Gcal/h 150/80 °C | | oil |
| 28. | Cogeneration plant, Szerencs Sugar Works | Hungary | 1967 | 2x32 t/h, 8,4 MW, 46 bar/420 °C | oil | |
| 29. | Cogeneration plant, Szolnok Sugar Works | Hungary | 1968 | 2x40 t/h, 10,5 MW, 45 bar/420 °C | oil | |
| 30. | Cogeneration plant, Magyaróvár Alumina Works | Hungary | 1968 | 2x35 t/h, 10,7 MW, 70 bar/500 °C | coal | |
| 31. | Extension of cogeneration plant, Kispest | Hungary | 1970 | 2x50 t/h, 12,6 MW, 116 bar/500 °C | | coal |
| 32. | Extension of power station, Almásfüzitő Aluma Works | Hungary | 1971 | 35 t/h 70 bar/500 °C | coal | |
| 33. | ETIBANK power Station | Turkey | 1971 | 8x13,2 MW gas turbine | | n.gas |
| 34. | Extension of cogeneration plant, Nyíregyháza | Hungary | 1973 | 2x60 t/h, 8,5 MW 43 bar/430 °C | n. gas | oil or |
| 35. | Extension of power station, Devnia | Bulgaria | 1974 | 5x220 t/h, 2x21,3 MW, 101 bar/540 °C | | n. gas |
| 36. | Extension of cogeneration plant, Sopron | Hungary | 1976 | 2x35 t/h, 10,5 MW 37 bar/450 °C | oil | |

## Conventional Heat Production - Power and Heating Plants

| Ref. No. | Description | Country | Year | Remarks | |
|---|---|---|---|---|---|
| 37. | Extension of cogeneration plant, Győr | Hungary | 1976 | 2x50 Gcal/h, 150/70 °C | n. gas |
| 38. | Power station, Sirte | Libya | 1976 | 3x10 MW, gas turbine | n. gas |
| 39. | NESTE power station | Finland | 1977 | 1x30 MW gas turbine | n. gas |
| 40. | Power station, Obrovac Aluminia Works | Yugoslavia | 1987 | 3x80 t/h, 17,5 MW 100 bar/535 °C | n. gas |
| 41. | Power station, Paros island | Greece | 1978 | 3x2,6 MW | oil diesel |
| 42. | Power station, Kalymnos island | Greece | 1979 | 4x2,6 MW and 2x5,2 MW diesel | oil |
| 43. | Pre-heater plant, Schönwalde | Germany | 1984 | 200+105 t/h water | flue gas |
| 44. | Power station boilers, Neyveli | India | 1986 | 3x670 t/h 163 bar/540 ºC | lignite |
| 45. | Condensate water polishing system Datong Power Plant | China | 1988 | 2x550 t/h | |
| 46. | Extension of power station, Dorog | Hungary | 1989 | 50 t/h 40 bar/450 ºC | coal |
| 47. | Reconstruction of IC system, Sopron Power Station | Hungary | 1989 | 2x35 t/h 40 bar/425 ºC | oil or n.gas |
| 48. | Boiler plant, Szentendre Paper Works | Hungary | 1990 | 16 t/h | oil |
| 49. | Reconstruction of I&C system, Győr Power Station | Hungary | 1990 | 2x35 t/h 40 bar/425 °C | oil or n. gas |
| 50. | I&C system in power plant, Petőháza Sugar Works | Hungary | 1990 | 60 t/h 40 bar/450 °C | oil or n. gas |
| 51. | Boiler reconstruction, Tatabánya Power Station | Hungary | 1991 | 2x55 t/h 31 bar/415 °C | oil |
| 52. | Extension of Győr power plant | Hungary | 1991 | 75 t/h 40 bar/425 °C | oil or n. gas |
| 53. | I&C system, Győr power plant | Hungary | 1991 | 75 t/h 40 bar/425 °C | oil or n. gas |
| 54. | Combined cycle plant extension, boiler plant Debrecen, (PFS, FS, DSI) | Hungary | 1993 | 80 MWe | |
| 55. | Fluidized bed combustion boiler extension, Pécs power station | Hungary | 1993 | 85-100 MWe | coal |

## Conventional Heat Production - Power and Heating Plants

| Ref. No. | Description | Country | Year | Remarks | |
|---|---|---|---|---|---|
| 56. | Circulating fluidized bed combustion boiler and steam turbine extension, Inota power station, (PFS, FS, DSI) | Hungary | 1993 | 150 MWe | coal |
| 57. | Circulating fluidized bed combustion boiler and steam turbine extension, Borsod power station (PFS) | Hungary | 1993 | 150 MWe | coal |
| 58. | Combined cycle plant extension, cogeneration plant Kispest (CS) | Hungary | 1993 | 60-140 MWe | n. gas |
| 59. | Retrofit of 215 MW units of Dunamenti power station (CS) | Hungary | 1995 | 215 MWe | n. gas or oil |
| 60. | Ash conditioning system, Dunamenti Power Station | Hungary | 1995 | ammonia dosage and dust processing | |
| 61. | Hydro Power Plant, Ghamashiab | Iran | 1997 | 2x1,5 MWe | |
| 62. | Back pressure Power Station, Dunaferr | Hungary | 1997 | 5,6 MWe<br>35 bar/400 °C | |
| 63. | Auxiliaries for gas turbine plant, Sajószöged | Hungary | 1998 | oil system, water system I&C, civil works, etc. | |
| 64. | Auxiliaries for gas turbine plant, Litér | Hungary | 1998 | oil system, water system I&C, civil works, etc. | |
| 65. | Desulfurization plant, Mátra Power Station | Hungary | 2000 | joint venture with Deutsche Babcock Anlagen for 636 MWe capacity | |
| 66. | Auxiliaries for secondary reserve gas turbine plant, Lőrinci | Hungary | 2000 | 170 MWe | |
| 67. | Installation of steam turbine and generator unit, Onyx Kft. waste incineration | Hungary | 2002 | 857 $kW_e$, 10 t/h;<br>16 bar/260°C | |
| 68. | Boiler plant reconstruction Nyíregyháza, Power Plant | Hungary | 2005 | oil system, water system, steam system, etc. | |
| 69. | North Buda gas turbine cogeneration Heating plant | Hungary | 2007<br>2007<br>2008<br>2008 | 9,88 MWe<br>9,88 MWe<br>30.22 MWe<br>49.98 MWe | |
| 70. | Ajka OCGT plant (BOP) | Hungary | 2010 | 2x58 MWe gas turbines | |

## 2.3 HEAT RECOVERY UNITS

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 1. | Cogeneration plant, Tisza Chemical Works | Hungary | 1963 | 42 t/h, 4,5 MW 41 bar/450 °Cheat waste boiler |
| 2. | Boiler plant, Orosháza Glass Factory | Hungary | 1972 | 5x3,6 t/h 16 bar/320 °C waste heat boiler |
| 3. | Boiler plant, Orosháza Glass Factory | Hungary | 1974 | 10 t/h 16 bar/320 °C waste heat boiler |
| 4. | Boiler plant, Salgótarján Glass Factory | Hungary | 1974 | 1,5 Gcal/h 130/110 °C waste heat boiler |
| 5. | Boiler plant, Tokod Glass Factory | Hungary | 1977 | 3 t/h, 12 bar waste heat boiler |
| 6. | Boiler plant, Salgótarján Glass Factory | Hungary | 1979 | 4,5 t/h 7 bar waste heat boiler |
| 7. | Boiler plant, Százhalombatta Oil Refinery | Hungary | 1979 | 5,7 t/h 12 bar waste heat boiler |
| 8. | Boiler plant, Dunaújváros Metallurgical Works | Hungary | 1979 | 26 t/h 18 bar/320 °Cheat waste boiler |
| 9. | Combinated cycle power plant, Aliaga | Turkey | 1980 | 4x60 t/h, 2x30 MW 37 bar/450 °Cheat waste boiler |
| 10. | Boiler plant, Miskolc Metallurgical Work | Hungary | 1980 | 12 t/h 11 bar waste heat boiler |
| 11. | Boiler plant, Martfű Shoe Factory | Hungary | 1980 | 6,5 t/h 14 bar waste heat boiler |
| 12. | Boiler plant, Pulmonological Institute, Budakeszi | Hungary | 1981 | 1,5 t/h 6 bar waste heat boiler |
| 13. | Waste heat recovery boiler plant, CEREOL Veg.Oil Factory, Martfű | Hungary | 1981 | 3x15 t/h 30 bar/380 °Csees shell sunflower |

## Heat Recovery Units

| Ref. No. | Description | Country | Year | Remarks | |
|---|---|---|---|---|---|
| | Mátra Power Station | Hungary — | 1983 | LOTHUS system, green house heating | |
| 14. | Waste heat recovery boiler plant, Kecskemét | Hungary | 1981 | 6 t/h 12 bar | sawdust& cuttings |
| 15. | Waste heat recovery boiler plant, CEREOL Veg.Oil Factory, Győr | Hungary | 1981 | 10 t/h 16 bar 240 °C | sunflower seed shell |
| 16. | Boiler plant, TUNGSRAM, Nagykanizsa | Hungary | 1982 | 4,1 t/h 4 bar | waste heat boiler |
| 17. | Boiler plant Salgótarján Glass Factory | Hungary | 1982 | 1 Gcal/h 130/110 °C | waste heat boiler |
| 18. | Waste heat recovery boiler plant, Budavidék Forestry, Budakeszi | Hungary | 1982 | 2x2 t/h 12 bar | chips of woods |
| 19. | Waste heat recovery boiler plant, Nagykunság Forestry, Nagykőrös | Hungary | 1982 | 2x4 t/h 12 bar | wood-waste |
| 20. | Boiler plant, Ajka Glass Works | Hungary | 1983 | 2.4 t/h 2 bar | waste heat boiler |
| 21. | Waste heat recovery boiler plant, Délalföld Forestry, Szeged | Hungary | 1983 | 10 t/h 12 bar | wood-waste |
| 22. | Waste heat recovery boiler plant, Pilis State Forestry, Visegrád | Hungary | 1983 | 2x4 t/h 12 bar | wood-waste |
| 23. | Boiler plant, Nemsova Glass Works | Czechoslovakia | 1984 | 3x1.5 t/h 4 bar | waste heat boiler |
| 24. | Boiler plant, Dunaújváros Steel Works | Hungary | 1984 | 4x15.5 t/h 18 bar/320 °C | waste heat boiler |
| 25. | Boiler plant, Light Metal Works, Székesfehérvár | Hungary | 1984 | 12 t/h 8 bar/220 °C | waste heat boiler |

## Heat Recovery Units

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 26. | Waste heat recovery boiler plant, CEREOL Veg.Oil Factory Nyírbátor | Hungary | 1984 | 10 t/h 16 bar/240 °C sunflower seed shell |
| 27. | Waste heat recovery boiler plant, CEREOL Veg.Oil Factory Győr | Hungary | 1984 | 10 t/h 16 bar/240 °C sunflower seed shell |
| 28. | Waste heat recovery boiler plant, CEREOL Veg.Oil Factory, Budapest | Hungary | 1984 | 10 t/h 16 bar/240 °C sunflower seed shell |
| 29. | Waste heat recovery boiler plant, Textile Plant, Nagylak | Hungary | 1984 | 10 t/h 12 bar wood-waste & hemp tow |
| 30. | Boiler plant, Glass Works, Dubravka | Czechoslovakia | 1985 | 1.5 t/h 5 bar waste heat boiler |
| 31. | Boiler plant, Glass Works, Salgótarján | Hungary | 1986 | 2.2 Gcal/h 130/110 °C waste heat boiler |
| 32. | Boiler plant, Moravian Glass Works, Kvetna | Czechoslovakia | 1986 | 1 t/h 6 bar waste heat boiler |
| 33. | Waste heat recovery boiler plant, Furniture Works, Rousinov | Czechoslovakia | 1986 | 2x6 t/h 12 bar wood waste |
| 34. | Waste heat recovery boiler plant, Timber Plant, Bystrice pod Hostinem | Czechoslovakia | 1986 | 8 t/h 12 bar sawmill waste |
| 35. | Boiler plant, Petroleum Refinery, Tiszaújváros | Hungary | 1987 | 4.5 t/h 12 bar waste heat boiler |
| 36. | Boiler plant, Metallurgical Works, Diósgyőr | Hungary | 1987 | 25 t/h 36 bar 430 °C waste heat boiler |
| 37. | Waste heat recovery boiler plant, CEREOL Veg.Oil Factory. Rákospalota, Budapest | Hungary | 1987 | 10 t/h 16 bar/240 °C sunflower seed shell |

## Heat Recovery Units

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 38. | Waste heat recovery boiler plant, CEREOL Veg. oil Factory Kőbánya, Budapest | Hungary | 1987 | 10 t/h sunflower 16 bar/240 ºC seed shell |
| 39. | Boiler plant, Petroleum Refinery, Százhalombatta | Hungary | 1988 | 5 t/h waste 16 bar/270 ºC heat boiler |
| 40. | Boiler plant, Blass Factory, Lednicke Rovne | Czechoslovakia | 1988 | 2x1.5 t/h waste 6 bar heat boiler |
| 41. | Boiler plant, Petroleum Refinery, Százhalombatta | Hungary | 1988 | 16 t/h waste 16 bar/270 ºC heat boiler |
| 42. | Waste heat recovery Boiler plant CEREOL Veg.Oil Factory, Martfű | Hungary | 1988 | 15 t/h sunflower 30 bar/380 ºC seed shell |
| 43. | Boiler plant, Chemical Factory, Breclav | Czechoslovakia | 1989 | 6 t/h waste 25 bar heat boiler |
| 44. | Boiler plant, Slovakian Glass Factory Nemsova | Czechoslovakia | 1989 | 2x1.5 t/h waste 3 bar heat boiler |
| 45. | Boiler plant, Glass Factory Poltar | Czechoslovakia | 1989 | 0.9 Gcal/h waste 130/90 ºC heat boiler |
| 46. | Boiler plant, Glass Factory, Jaroslaw | Poland | 1989 | 2x1.5 t/h waste 4 bar heat boiler |
| 47. | Waste heat recovery boiler plant FALCO Timber Processing Plant, Körmend | Hungary | 1989 | 2x4 MW mixed 110/90 ºC wood |
| 48. | Waste heat recovery boiler plant, Furniture Works Trebic | Czechoslovakia | 1989 | 4 t/h cuttings & 10 bar sawdust |
| 49. | Waste heat recovery boiler plant, CEREOL Veg. Oil Factory Nyírbátor | Hungary | 1989 | 10 t/h sunflower 16 bar/240 °C seed shell |
| 50. | Boiler plant, Glass Works, Torgau | Germany | 1990 | 13 t/h waste 16 bar/240 °C heat boiler |
| 51. | Boiler plant, Glass Factory, Jaroslaw | Poland | 1990 | 2x1,5 t/h waste 4 bar heat boiler |

## Heat Recovery Units

| Ref. No. | Description | Country | Year | Remarks | |
|---|---|---|---|---|---|
| 52. | Heat recovery unit for autoclaves, HEBEL Zehdenick | Germany | 1995 | | |
| 53. | Heat recovery unit MOL, Szeged | Hungary | 1999 | | waste heat recovery unit for gas turbine (Type Taurus 70 Solono) |
| 54. | Steam recovery, BorsodChem Kazincbarcika | Hungary | 2005 | | waste heat boiler |
| 55. | Waste heat recovery boiler plant, Villeroy & Boch Magyarország Zrt. | Hungary | 2007 | 460 kW 110/90°C | waste heat boiler |
| 56. | Waste heat recovery boiler plant, Villeroy & Boch Magyarország Zrt. | Hungary | 2007 | 220 kW 110/100°C | waste heat boiler |

)

## 2.4 NUCLEAR POWER PLANT RELATED ENGINEERING AND SERVICE PROJECTS

| Ref. No. | Scope of work at Paks I. Nuclear Power Plant, Hungary | Year |
|---|---|---|
| 1. | Mechanical earthquake proofing design using “EASY FIX” software | 1994. |
| 2. | Design of the „Paks Maintenance Center” | 1994 – 95. |
| 3. | Mechanical, electrical, instrumentation & control design work for Paks Maintenance Directorate | 1994 |
| 4. | Mechanical, electrical and I&C design of emergency feedwater pumps | 1995 – 96. |
| 5. | Measurement of the thermal capacity at closed loop heat exchangers | 1997. |
| 6. | Detailed design and EPC contracting of increased earthquake proofing of piping and steel structures of primary circuit in Units 1 – 4. | 1998. |
| 7. | Mechanical design for strengthening of Nr. 1 water treatment circuit of Units 1 – 4 | 1998. |
| 8. | Mechanical design and EPC contracting for increased earthquake proofing of live steam pipelines in the reactor hall and hermetic compartments of Units 1 – 4. | 1998 – 99. |
| 9. | Design and EPC contracting of overpressure control system of Units 1 – 4. | 1999 – 02. |
| 10. | Design of pressure relief system of Units 1 – 4. | 1999 – 02. |
| 11. | Modification of the steam generator header covers of Units 1-4. EPC contracting. | 1999 – 02. |
| 12. | Seismic qualification and structural strength calculation of small-bore piping of secondary circuits of Units 1-4. | 2000 – 02. |
| 13. | Status report on high pressure feedwater preheaters. | 2001. |
| 14. | Modification of foam extinguishing system of the turbine hall (Units 1-4). EPC contracting. | 2001 – 02. |
| 15. | Feasibility study on modification of high pressure feedwater preheaters. | 2001 |
| 16. | Status report and qualification of the nozzles of safety valves “SC 50” | 2002. |
| 17. | Feasibility study on replacement of high pressure feedwater preheaters | 2003. |
| 18. | Design of implementation of TN01 iodine filters | 2003. |
| 19. | EPC contract for replacement of pipe lines under DN 200 mm of the safety cooling system of Unit No.2. | 2005 - 06. |
| 20. | Status report on outdoor 01, 02 TM55 pipeline running on pipe racks. | 2005. |
| 21. | Review of steam supply of turbine stuffing boxes | 2005. |
| 22. | Independent expert opinion on selection of oil pumps of the diesel generators of Unit 1 and 2. | 2005. |
| 23. | Licensing documentation for changing the thermostats of emergency diesels. | 2005. |
| 24. | Independent expert opinion of division of steam space of pressure suppression towers by installing burst plate before the flap, dividing the bubbling tray compartment from the steam space (Units 1 – 4) | 2005. |
| 25. | Licensing documentation on installation of strainer in the trickle-water pit. | 2005. |
| 26. | Design of 01UJ17(18)B001 tank level control | 2006 |
| 27. | Independent expert report on increase of daily tank capacity of diesel generators (Units 3 and 4) | 2006 |
| 28. | Independent expert opinion on shaft and impeller change of main circulating pumps of the primary circuit (Units 1, 3 and 4) | 2006 |
| 29. | Independent expert opinion on reducing the impact of guillotine break of pipelines of primary circuit | 2006 |
| 30. | Independent expert opinion on the effect of blow down of auxiliary steam lines into the hermetic compartments | 2006 |
| 31. | Installation of new valves to increase redundancy of the fire water system (EPC contract) | 2006 |
| 32. | Design of a new condensate pipeline of 02WO30-34B001 tanks (Units 3 and 4) | 2006 |
| 33. | Design of installation of iron / manganese filters | 2006 |
| 34. | Design of maintenance tool of actuators of SZBV type valves. | 2006 - 07 |
| 35. | Design of new 01WWB001 type caustic soda tank | 2006 - 07 |
| 36. | Study on possible bypassing of high pressure feedwater heaters (Units 1-4) | 2006 - 07 |
| 37. | Installation of new type (10-40TN01,TN02,TL02) of iodine filters | 2006 - 08 |
| 38. | EPC contract for replacement of pipe lines under DN 200 mm of the safety cooling system of Unit No.1. | 2006 - 08 |
| 39. | Design review of the change of the 01(02)TW44D001 type pumps | 2008 |
| 40. | EPC contract for replacement of pipe lines under DN 200 mm of the safety cooling system of Unit No.3, 4. | 2008 - 10 |
| 41. | Detailed design of new low pressure compressed air pipeline in the hermetic compartments | 2009 - 10 |

## Nuclear power plant related engineering and service projects

| Ref. No. | Scope of work at Paks I. Nuclear Power Plant, Hungary | Year |
|---|---|---|
| 42. | Detailed design of new low pressure compressed air pipeline in the hermetic compartments | 2009 - 10 |
| 43. | Review of motive air pipeline of YP safety valves | 2009 |
| 44. | Design of new steam pipe line to the stuffing boxes of turbines (Units 1 – 4). | 2009 |
| 45. | Design of replacement of the 01(02)TW44 type pumps | 2010 |
| 46. | Design of motive air pipeline of YP safety valves | 2010 |
| 47. | Design mockup stand of actuators of SZBV type valves | 2010 |
| 48. | Design of installation of new hydrogen recombiners (Units 1-4) | 2010 - 11 |
| 49. | Design of strengthening of TG pipeline of the spent fuel pond (Units 1-4) | 2010 - 13 |
| 50. | Design of core catcher modification (Units 1-4) | 2010 - 14 |
| 51. | Feasibility study on cooling options of Paks Extension (for Units 5-6). | 2010 - 11 |
| 52. | Data sharing / update for AVEVA PDMS model | 2011 |
| 53. | Design of modification of steel structure of SZBV type valve actuator mockup stand | 2012 |
| 54. | Design of submerge able actuators of valves in hermetic compartments | 2012 - 13 |
| 55. | Design of replacement of gas blowers in auxiliary buildings I. & II. | 2013 - 15 |
| 56. | Seismic qualification and structural strength calculation of steam generator tanks' RZ blowdown piping of Unit 3. | 2014 |
| 57. | Hydraulic revision of the safety cooling system at the box (Units 1-4) | 2014 |
| 58. | Seismic qualification and structural strength calculation of a new emergency cooling system's piping | 2014 - 15 |
| 59. | Design and seismic qualification and structural strength calculation of steam generator tanks' RZ blowdown piping of Units 1- 4 | 2015 |
| 60. | Design of replacement of the 01(02)TC12 type pumps and modification of the waste condense water pipeline system | 2015 |
| 61. | Design of replacement of cleaning valves into the condensate pipelines of the high pressure feed water heaters (Units 1-4) | 2015 - 16 |
| 62. | Design of replacement of a new regulation valve into the block regulation system (Units 1-4) | 2016 |
| 63. | Feasibility study on radiation protection of pipe lines in room A101 (Units 1-4) | 2016 |
| 64. | EPC contract for increased earthquake proofing of boron pipelines in auxiliary buildings I-II (Units 1-4) | 2016 - 17 |
| 65. | Design of radiation protection of pipe lines in room A101 (Units 1-4) | 2017 |
| 66. | EPC contract for replacement of Drain pool's pumps (Units 1-4) | 2018 - 23 |
| 67. | EPC contract for replacement of Sprinkler system's pumps (Units 2 & 4) | 2019 - 23 |
| 68. | EPC contract for replacement of FKSz system's pumps (Unit 4) | 2019 - 24 |
| 69. | Design of Unit's inside cooling regulation system (Unit 3) | 2020 |
| 70. | EPC contract for replacement of the complete H2O2 system's | 2021 - 22 |

## 2.5 WATER TREATMENT PROJECTS

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 1. | Condensate water polishing system Datong Power Plant | China | 1988 | 2x550 $m^3/h$ |
| 2. | Reactor reconstruction for the Water Treatment Plant in the BORSOD PP. | Hungary | 1993 | Reconstruction<br>250 $m^3/h$<br>Turn-key |
| 3. | Water Treatment RO Plant, Oroszlány P.S. | Hungary | 1994 | Reconstruction<br>2 x 25 $m^3/h$<br>Ultra filter<br>Reverse osmosis<br>Turn-key |
| 4. | Water Treatment RO Plant, Debrecen P. P. | Hungary | 1995 | New 180 $m^3/h$ (softener)<br>4 x 60 $m^3/h$ demineraliser<br>2 x 170 $m^3/h$ mixed-bed<br>Turn-key |
| 5. | Water Treatment Plant, LITÉR Gas turbine P.P MVM (Hungarian Electricity Board) | Hungary | 1998 | New<br>2 x 70 $m^3/h$<br>RO + Mixed-bed<br>Turn-key |
| 6. | Water Treatment Plant, SAJÓSZÖGED Gas turbine P.P MVM (Hungarian Electricity Board) | Hungary | 1998 | New<br>2 x 70 $m^3/h$<br>RO + Mixed-bed<br>Turn-key |
| 7. | Extension of Water Treatment Plant Plant at Richter Gedeon Co. Ltd (Pharmaceutics Factory), Budapest | Hungary | 1998 | Extension<br>60 $m^3/h$ RO<br>Desalination with biological cleaning |
| 8. | Renovation of the pre-treatment of the settled Alkaline Water Treatment Plant at Balti P.P | Narva Estonia | 1999 | New<br>3 x 75 $m^3/h$ sand filter<br>2 x 150 $m^3/h$ active carbon filter<br>2 x 50-55 $m^3/h$ RO<br>Turn-key |
| 9. | Water Treatment Plant, LŐRINCI Gas turbine P.P MVM (Hungarian Electricity Board) | Hungary | 2000 | New<br>2 x 80 $m^3/h$<br>Ultra filter<br>2 x 36 $m^3/h$ reverse osmosis<br>4 x 36 mixed bed<br>Turn-key |
| 10. | Water treatment plant at Narva P.P | Narva Estonia | 2001 | New<br>2 x 150 $m^3/h$ softener<br>2 x 80 $m^3/h$ demineralizer<br>2 x 120 $m^3/h$ mixed bed<br>Turn-key |

## Water Treatment Projects

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 11. | Extension of the Water Treatment Plant, of the settled alkaline water, Balti P.P | Narva Estonia | 2002 | New<br>140 $m^3/h$<br>Clarifier, Gravel filter, Active carbon filter<br>Reverse osmosis<br>Turn-key |
| 12. | TVK Water Treatment Plant Tisza WTP Ltd. | Hungary | 2004 | New<br>450 / 560 $m^3/h$<br>ultra filter, reverse osmosis, mixed bed<br>Turn-key |
| 13. | GYŐR District heating station | Hungary | 2007 | 10 $m^3/h$<br>Fe, Mn filter<br>RO<br>Na ion exchanger |
| 14. | Szakoly P.P | Hungary | 2008 | 1 x 17.6 $m^3/h$<br>Methane deareator<br>2 x 8.8 $m^3/h$ gravel filter<br>2 x 8.8 $m^3/h$ Fe, Mn separator<br>2 x 5 $m^3/h$ RO (single pass)<br>Cooling make-up water<br>2 x 5.5 $m^3/h$ RO (double pass)<br>2 x 5.5 $m^3/h$ membrane $CO_2$ deareator<br>2x50 $m^3/h$ condensate polishing plant<br>2x5.0 $m^3/h$ EDI boiler make-up water<br>5 $m^3/d$ drinking water treatment |

## 2.6 FUEL HANDLING AND STORAGE PLANTS

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 1. | Oil storage tanks, co-generation plant, Tatabánya | Hungary | 1991 | 2x10.000 $m^3$ |
| 2. | Oil storage tank and auxiliaries, Oroszlány Power Station | Hungary | 1992 | 1x10.000 $m^3$ |
| 3. | Tank farm, Dunamenti Power Station | Hungary | 1994 | 3x30.000 $m^3$ oil storage tanks |
| 4. | Fuel oil and gas supply system for Kelenföldi combined cycle plant (CS) | Hungary | 1995 | 2x2.500 $m^3$ l. oil n. gas |
| 5. | Tank farm, Tiszai power station | Hungary | 1995 | 4x20.000 $m^3$ tanks with pump stations |
| 6. | Fuel oil tanks at various power plants | Lithuania | 1996 | 11 pcs oil tanks for 105 000 $m^3$ over all capacity |
| 7. | Light oil storage plant Sajószöged | Hungary | 1998 | 2x1000 $m^3$ |
| 8. | Light oil storage plant Litér | Hungary | 1998 | 2x1000 $m^3$ |
| 9. | Light oil storage plant Lőrinci | Hungary | 2000 | 2x2000 $m^3$ |
| 10. | Railway heavy oil reloading station Komoró (Hungarian State Railway) | Hungary | 2001 | daily 10 wagon capacity 55 $m^3/h$ |
| 11. | Gas oil handling plants for MÁV Zrt. (Hungarian Railway) | Hungary | 2002-2008 | 44 pcs. plants on different places |
| 12. | Quench oil unloading station for TVK Nyrt. (Chemical plant) | Hungary | 2008 | Daily 5 wagon unloading capacity |

## 2.7 POWER PLANT WASTE PROCESSING AND DISPOSAL SYSTEMS (DENSE SLURRY SYSTEMS)

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 1. | Pécs Power Plant 200 MWe<br>Dense slurry plant | Hungary | 1991 | 3 x 100 tons/h dry solids mixing units (slag/flash)<br>Intermittent (Emulgat) mixing technology<br>2 km slurry transport distance<br>Fly ash storage system extension |
| 2. | Tatabánya Power Station 30 MWe<br>Dense slurry plant | Hungary | 1993 | 2 x 20 tons/h of dry solids mixing units (flash)<br>CIRCMIX continuous mixing technology<br>0.5 km slurry transport distance |
| 3. | Borsod Power Plant 200 MWe<br>Dense slurry plant | Hungary | 1996 | 2 x 102 tons/h dry solids mixing units (slag/flash)<br>CIRCMIX continuous mixing technology<br>2 x 100 $m^3$/h piston type slurry pump<br>3 sets of dense slurry transport lines<br>3 km slurry transport distance |
| 4. | Mátra Power Plant 836 MWe<br>Dense slurry plant | Hungary | 1998 | 4 x 160 tons/h of dry solids mixing units (slag/flash/ FGD gypsum)<br>CIRCMIX continuous mixing technology<br>2 x 750 $m^3$/h slag slurry thickener<br>3 x 240 $m^3$/h transport lines<br>3 sets of centrifugal type slurry pumps in series per transport line<br>3.6 km slurry transport distance |
| 5. | Jacksonville Northside<br>600 MWe Generating Station, CFB Unit<br>1 & 2 / Dense slurry mixers | USA, Florida | 2001 | 2 x 62.5 tons/h of fly ash<br>+ 2 x 62.5 t/h of fly ash slurry + bed ash mixing units (high $CaSO_4$ fly ash / high CaO bed ash)<br>CIRCUMIX continuous mixing technology/ high concentration slurry<br>2 sets of piston diaphragm type slurry distance transport pumps (supplied by GEHO under separate contract for the Client) |
| 6. | Timisoara Sud Power Plant<br>270 MWe Dense slurry plant extension | Romania | 2001/2007 | 18 t/h of solids mixing units (low CaO ash)<br>CIRCUMIX continuous mixing technology<br>Slag transfer system (by Client)<br>30 $m^3$/h transport lines (by Client)<br>2 sets of membrane diaphragm type piston pumps for distance slurry transport (supplied by GEHO / ABEL under separate contracts for the Client)<br>7 km slurry transport distance<br>10 m geodetic level difference |
| 7. | Craiova-II Power Plant Dense Slurry Plant<br>300 MWe energetic units<br>(+8 district heating boilers) | Romania | 2010 | 3 x 60.2 t/h of dry solids (9.2 t/h bottom ash<br>+ 51 t/h fly ash) mixing units<br>CIRCUMIX continuous mixing technology<br>3 x120 $m^3$/h transport slurry lines (by Client)<br>3 sets of FELUVA membrane diaphragm slurry pumps for distance transport (by Client)<br>9400 m transport distance<br>90 m geodetic level difference |
| 8. | TENT-A Power Plant Dense Slurry Plant<br>4 x 340 MWe energetic units | Serbia | Under construction | 4 x 228,4 t/h of dry solids<br>(13,7 t/h bottom ash, 25,4 t/h coarse ash, 156,3 t/h fly ash and 33 t/h FGD gypsum), 2 working and 2 standby mixing units. CIRCUMIX continuous mixing technology. 4 x 355 m3/h tranport slurry line (by consortium partner). 4 x 3 sets centrifugal slurry pumps for distance transport.<br>5500 m transport distance. 47 m geodetic level difference. |

## Power Plant Waste Processing and Disposal Systems (Dense Slurry Systems)

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 8. | Isalnita Power Plant Dense Slurry Plant | Romania | 2010 | 4x57 t/h of dry solids (7t/h bottom ash +50 t/h fly ash)<br>630 MWe (2x510 t/h) boilers gas unit<br>mixing units (low CaO ash +<br>FGD gypsum)<br>CIRCUMIX continuous mixing technology<br>2 x 120 $m^3$/h transport slurry lines (by Client) – 2 ash<br>fields; 4 sets of Warman centrifugal pump groups<br>(3 pumps/group) for distance transport (by Client)<br>4600 m transport distance<br>45 m geodetic level difference |
| 9. | Rovinari Power Plant / Dense Slurry Plant 1320 MWe | Romania | 2012 | 4 x 190 t/h at dry solids (30 t/h bottom ash +<br>127 t/h fly ash + 33 t/h dry gypsum) mixing units<br>(low CaO ash + FGD gypsum)<br>CIRCUMIX continuous mixing technology<br>4 x 270 $m^3$/h transport slurry lines (by Client)<br>4 sets of Warman centrifugal pump groups<br>(3 pumps) for distance transport (by Client)<br>5600 m transport distance<br>32 m geodetic level difference |
| 10. | Turceni Power Plant / Dense Slurry Plant 2310 MWe | Romania | 2013 | 140 t/h at dry solids (30 t/h bottom ash +<br>110 t/h fly ash + 80 t/h dry gypsum) mixing units<br>CIRCUMIX continuous mixing technology<br>6 sets of Warman centrifugal pump groups<br>(24 pumps) for distance transport<br>5000 m transport distance<br>24 m geodetic level difference |

## 2.8 HEAT TRANSFER OIL BOILER PLANTS

| Ref. No. | Description | Country | Year | Remarks | |
|---|---|---|---|---|---|
| 1. | Heat-transfer oil boiler plant, Geisweld | Germany | 1971 | 2x4 Gcal/h 32 bar | n. gas |
| 2. | Heat-transfer oil boiler plant, Forestry Szombathely | Hungary | 1975 | 2x0,6 Gcal/h, 285 °c | oil |
| 3. | Heat-transfer oil boiler plant, Oil Refinery, Tiszaújváros | Hungary | 1976 | 2x4 Gcal/h, | oil or n. gas |
| 4. | Heat-transfer oil boiler plant, KEMIKAL Building Materials Factory, Barcs | Hungary | 1978 | 2x0,7 MW | gas |
| 5. | Heat-transfer oil boiler plant, Chemical Industries, Kedzierzyn | Poland | 1980 | 2x1,6 Gcal/h 300 °C | n. gas |
| 6. | Heat-transfer oil boiler plant, KEMIKAL Insulation Products, Újkigyós | Hungary | 1983 | 1.6 Gcal/h 0.6 Gcal/h 285 °C | oil |
| 7. | Heat-transfer oil boiler plant, Chemical Products, Zalaegerszeg | Hungary | 1983 | 0.6 Gcal/h 300 °C | n. gas |
| 8. | Heat transfer oil boiler plant, Petroleum Refinery, Nyírbogdány | Hungary | 1984 | 0.6 Gcal/h 300 °C | oil |
| 9. | Heat-transfer oil boiler plant, NITROIL Chemical Works, Várpalota | Hungary | 1985 | 0.6 Gcal/h 300 °C | oil |
| 10. | Heat-transfer oil boiler plant, Petroleum Refinery, Tiszaújváros | Hungary | 1986 | 4 Gcal/h | n.gas or oil |
| 11. | Heat-transfer oil boiler plant, Oil industries, Almásfűzitő | Hungary | 1987 | 1.6 Gcal/h 285 °C | oil |
| 12. | Heat-transfer oil boiler plant, MIRELITE Refrigerating Industries, Miskolc | Hungary | 1988 | 1.6 Gcal/h 300 °C | n. gas |
| 13. | Heat-transfer oil boiler plant, PEVDI Chemical & Plastic Factory Gyömrő | Hungary | 1988 | 1 Gcal/h 320 °C | oil |

## 2.9 GAS ENGINE HEATING PLANTS

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 1. | Elektric Work (Sub-contractor) | Greece Paros Island | 1978 | 3 x 2600 kWe |
| 2. | Elektric Work (Sub-contractor) | Greece Kalymnos Island | 1978 | 4 x 2600 kWe<br>2 x 5200 kWe |
| 3. | Gas Engine Heating Plant Szentes | Hungary | 2003 | 1170 kWe |
| 4. | Gas Engine Heating Plant Region of Miskolc, Tatár Str. | Hungary | 2003 | 5 x 3900 kWe |
| 5. | Gas Engine Heating Plant Region of Miskolc, Diósgyőr | Hungary | 2003 | 1 x 3900 kWe |
| 6. | Gas Engine Heating Plant Region of Miskolc, Bulgárföld | Hungary | 2004 | 1 x 1011 kWe |
| 7. | Gas Engine CHP Plant Tatabánya Power Plant | Hungary | 2004 | 3 x 6000 kWe |
| 8. | Gas Engine CHP Plant Újpalota – Budapest | Hungary | 2005 | 3 x 7700 kWe |

## 2.10 BIOMASS PROJECTS

| Ref. No. | Description | Country | Year | Remarks |
|---|---|---|---|---|
| 1. | Biofuel production, Visonta | Hungary | 2007 | 40.000 t/year rape-seed oil production plant |
| 2. | Biomass-fired power plant Szakoly | Hungary | 2009 | biomass-fired combined cycle power plant<br>plant capacity: 20 MWe |
| 3. | Zöldforrás Biogas Power Plant, Szeged | Hungary | 2012 | biogas-fired cogeneration power plant<br>biogas production: 3.88 Mm3/year |

# CONTACT

## MVM EGI Zrt.

www.mvmegi.com
E-mail: info@mvmegi.com
Tel.: +36 1 225 6100
Office: Irinyi József str. 4-20,
Budapest, Hungary 1117



MVM EGI