



**INSTITUTE FOR NUCLEAR SCIENCES VINCA**  
**Laboratory for Thermal Engineering and Energy**  
**Thermal Power Plants Department**

**THERMAL POWER PLANTS TESTING**  
**Selected References**  
**2008-2014**

April 2014

**(A) VARIOUS TESTINGS OF POWER PLANTS**

(Adjusting of operating parameters, Determination of specific heat consumption, Acceptance – performance testings according to DIN 1942 and DIN 1943)

1. ADJUSTING AND OPTIMIZATION OF OPERATING PARAMETERS OF TPP NIKOLA TESLA B2 (670 MWe) BOILER UNIT (after reconstruction and upgrading), NIV-LTE , Vinca, 2008. (in Serbian)
2. POSSIBILITIES AND GUIDELINES FOR THE ENLARGED STEAM PRODUCTION OF TPP NIKOLA TESLA A6 (308 MWe) BOILER UNIT (based on boiler unit testing), NIV-LTE, Vinca, 2008. (in Serbian)
3. ACCEPTANCE TESTING OF TPP TUZLA BOILER UNIT #5 (200 Mwe), NIV-LTE 390-1, Vinca, 2008. (in English)
4. TESTING AND DETERMINATION OF OPERATING PARAMETERS OF UNIT A1 (220 MWe) AT TPP NIKOLA TESLA (after general overhaul), NIV-LTE 365, Vinča, 2008. (in Serbian)
5. TESTING, INSPECTION AND CALCULATION OF TPP NIKOLA TESLA A6 (308 MWe) BOILER PARAMETERS (with objective to enable preparation of the second stage of overhaul), NIV-LTE 370, Vinča, 2008. (in Serbian)
6. TESTING AND ANALYSES OF OPERATING PARAMETERS OF TPP KOSTOLAC B1&B2 (2x348,5 Mwe) BOILER UNITS (after general overhaul 2007 and 2008), NIV-LTE 373, Vinča, 2008 (in Serbian)
7. POSSIBILITIES FOR ENLARGED STEAM PRODUCTION OF TPP NIKOLA TESLA B2 (620 MWe) BOILER UNIT, NIV-LTE 388, Vinca, 2008. (in Serbian)
8. TESTING OF BOILER UNIT A6 (308 MWe) AT TPP NIKOLA TESLA (before general overhaul 2008.), NIV-LTE 391, Vinča, 2008. (in Serbian)
9. ADJUSTMENT AND OPTIMIZATION OF B2 BOILER UNIT (620 MWe) AT TPP NIKOLA TESLA (after general overhaul 2008), NIV-LTE 398, Vinča, 2008, (in Serbian)
10. TESTING OF A1 UNIT (200 MWe) AT TPP KOSTOLAC (after rehabilitation), NIV-LTE 401, Vinča, 2008. (in Serbian)
11. TESTING OF A3 BOILER UNIT (305 MWe) AT TPP NIKOLA TESLA (after general overhaul 2009), NIV-LTE 405, Vinča, 2009. (in Serbian)
12. TESTING OF B1&B2 UNITS (2x348,5 MWe) AT TPP KOSTOLAC (after general overhaul 2008), NIV-LTE 409, Vinča, 2009. (in Serbian)
13. TESTING AND OPTIMIZATION OF FIRING - 230 MWe BOILER UNIT AT TPP KAKANJ, NIV-LTE 412/3-rev.1.2, Vinca, 2009. (in Serbian)
14. DETERMINATION OF SPECIFIC HEAT CONSUMPTION OF TPP KAKANJ UNIT #7 (230 MWe), NIV-LTE 412/1 rev 1.6, Vinca, 2009. (in Serbian)
15. TESTING AND CALCULATION OF BOILER UNIT A6 (308 MWe) AT TPP NIKOLA TESLA IN ORDER TO PREPARE INCREASED STEAM PRODUCTION AND EFFICIENCY (Phase 1), NIV-LTE 414, Vinča, 2009. (in Serbian)

16. TESTING OF B1 BOILER UNIT (620 MWe) AT TPP NIKOLA TESLA (before maintenance 2009), NIV-LTE 416, Vinča, 2009. (in Serbian)
  17. TESTING OF A4 UNIT (305 MWe) AT TPP NIKOLA TESLA (after general overhaul 2009), NIV-LTE 421, Vinča, 2009. (in Serbian)
  18. TESTING, ADJUSTMENT AND OPTIMIZATION OF B2 UNIT (660 MWe) AT TPP NIKOLA TESLA (after increased steam production), NIV-LTE 424, Vinca, 2010. (in Serbian)
  19. TESTING OF B2 BOILER UNIT (348,5 MWe) AT TPP KOSTOLAC (before general overhaul 2010), NIV-LTE, Vinca, 2010. (in Serbian)
  20. TESTING AND CALCULATION OF BOILER UNIT A6 (308 MWe) AT TPP NIKOLA TESLA IN ORDER TO PREPARE INCREASED STEAM PRODUCTION AND EFFICIENCY (Phase 2), NIV-LTE 456, Vinca, 2010. (in Serbian)
  21. TESTING OF A5 BOILER UNIT (110 MWe) AT TPP KOLUBARA, NIV-LTE 459, Vinca, 2010. (in Serbian)
  22. TESTING, ADJUSTMENT, OPTIMIZATION AND DETERMINATION OF SPECIFIC HEAT CONSUMPTION OF B1 UNIT (660 MWe) AT TPP NIKOLA TESLA (after overhaul 2010), NIV-LTE 461, Vinca, 2011. (in Serbian)
  23. TESTING, ADJUSTMENT, OPTIMIZATION AND DETERMINATION OF SPECIFIC HEAT CONSUMPTION OF B2 UNIT (660 MWe) AT TPP NIKOLA TESLA (after overhaul 2010), NIV-LTE 475, Vinca, 2011. (in Serbian)
  24. TESTING OF A4 UNIT (305 MWe) AT TPP NIKOLA TESLA (in order to prepare increased power production) NIV-LTE 478, Vinča, 2011. (in Serbian)
  25. TESTING OF 200 MWe TURBINE AT TPP KOSTOLAC A2 (after general overhaul 2011), NIV-LTE 482, Vinca, 2011. (in English)
  26. VARIOUS TESTING OF A6 BOILER UNIT (308 MWe) AT TPP NIKOLA TESLA, NIV-LTE (after overhauls and modernization 2008 and 2010), NIV-LTE 487, Vinca, 2011. (in Serbian)
  27. ACCEPTANCE TESTING OF A6 BOILER UNIT (308 MWe) AT TPP NIKOLA TESLA, NIV-LTE 483, Vinča, 2011. (in Serbian)
  28. ACCEPTANCE AND OTHER TESTING OF 110 MWe TURBINE #6 AT TPP KAKANJ (Bosnia and Herzegovina), NIV-LTE 505, Vinca, 2012. (in Serbian)
  29. TESTING, ADJUSTMENT, OPTIMIZATION AND DETERMINATION OF SPECIFIC HEAT CONSUMPTION OF B1 UNIT (660 MWe) AT TPP NIKOLA TESLA (after overhaul 2011), NIV-LTE 506, Vinca, 2012. (in Serbian)
  30. TESTING OF 125 MWe UNIT AT TPP MORAVA (before overhaul 2012), NIV-LTE 509, Vinca, 2012. (in Serbian)
  31. TESTING OF A5 UNIT (308 MWe) AT TPP NIKOLA TESLA (before overhaul 2012), NIV-LTE 516-1, Vinca, 2012. (in Serbian)
  32. DETERMINATION OF SPECIFIC HEAT CONSUMPTION OF UNIT #6 (110 MWe) AT TPP KAKANJ (Bosnia and Herzegovina), NIV-LTE 520, Vinca, 2013 (in Serbian)
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33. ACCEPTANCE AND OTHER TESTING OF BOILER AT TPP KOSTOLAC-B2 (348,5 MWe), NIV-LTE 530, Vinca, 2013. (in Serbian)
34. ACCEPTANCE AND OTHER TESTING OF BOILER #6 (200 MWe) AT TPP TUZLA (Bosnia and Herzegovina), NIV-LTE 533, Vinca, 2013. (in Serbian)
35. DETERMINATION OF SPECIFIC HEAT CONSUMPTION OF UNIT #5 (110 MWe) AT TPP TUZLA (Bosnia and Herzegovina), NIV-LTE 550, Vinca, 2014 (in Serbian)

**(B) MILL TESTING<sup>1</sup>**

1. MILL MEASUREMENTS BOTH ON THE TWO UPGRADED AND TWO NOT MODIFIED DGS-100 MILLS AT TPP NIKOLA TESLA A3 (305 MWe), NIV-LTE, Vinca, 2008. (in English)
2. MILLS ACCEPTANCE AND ADDITIONAL TESTING OF VML 280.62k FAN MILLS IN TPP TUZLA 5 (200 MWe) (Bosnia and Herzegovina), NIV-LTE 404, Vinca, 2009. (in Serbian)
3. TESTING OF DGS-100 MILLS AND THEIR INFLUENCE TO THE COMBUSTION PROCESS AND BOILER OPERATION - TPP NIKOLA TESLA A3 (305 MWe), NIV-LTE 411, Vinča, 2009. (in Serbian)
4. RESULTS OF COAL DUST SIEVE ANALYSES – TPP KOSTOLAC-B (348,5 MWe), NIV-LTE 412, Vinča, 2009. (in English)
5. ACCEPTANCE TESTING OF VML 210.50 FAN MILLS AT TPP TUZLA 3 (100 MWe) NIV-LTE 417, Vinca, 2010. (in Serbian)
6. FAN MILLS TESTING AT TPP TUZLA 5 (200 MWe), NIV-LTE 428, Vinca, 2010. (in Serbian)
7. DGS 100 MILLS MEASUREMENTS - TPP NIKOLA TESLA-A3 (305 MWe) (Mills performance and supporting tests), NIV-LTE 463-1 rev.1, Vinča, 2010 (in English)
8. FAN MILLS TESTING AFTER UPGRADING – TPP KOSTOLAC B2 (348,5 MWe), NIV-LTE 470, Vinca, 2011. (in English)
9. DGS 100 MILLS MEASUREMENTS - TPP NIKOLA TESLA A4 (305 MW), (Mills performance and supporting tests), NIV-LTE 491, Vinca, 2011 (in English)
10. DGS 100 MILLS MEASUREMENTS - TPP NIKOLA TESLA A5 (340 MW), (Mills performance and supporting tests), NIV-LTE 515, Vinca, 2012 (in English)
11. FAN MILLS TESTING AFTER UPGRADING – TPP KOSTOLAC B2 (348,5 MWe), NIV-LTE 530, Vinca, 2013. (in English)
12. PERFORMANCE TESTING OF UPGRADED MILLS DGS 180 AT UNIT IV SES MEGALOPOLIS B, GREECE, NIV-LTE 535, Vinca, September 2013 (in English)
13. PERFORMANCE TESTING OF N270.45 MILLS AT TPP KOSTOLAC-B, NIV-LTE 539, Vinca, September 2013 (In Serbian)
14. VARIOUS TESTINGS AFTER SEVERAL RECONSTRUCTIONS OF DGS 100 MILLS AT TPP NIKOLA TESLA A5 (during October/November 2013), NIV-LTE 544, Vinca, November 2013 (In Serbian)
15. LOW NO<sub>x</sub> EMISSION PERFORMANCE TEST, Unit A5, TPP Nikola Tesla A, NIV-LTE 552, 2014 (in English)
16. DGS 100 MILLS MEASUREMENTS - TPP NIKOLA TESLA A5 (305 MW), (Mills performance and supporting tests), NIV-LTE 553, Vinca, 2014 (in English)

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<sup>1</sup> Mill testing is also a part of the various testing of boiler units given in the previous chapter.

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**(C) TESTING OF ELECTROSTATIC PRECIPITATOR (ESP)**

1. ACCEPTANCE TESTING OF ESP – TPP NIKOLA TESLA A4 (305 MWe), NIV-LTE 387, Vinca, 2008. (in Serbian)
  2. ACCEPTANCE TESTING OF ESP – TPP KOLUBARA A5 (110 MWe), NIV-LTE 455, Vinca, 2010. (in Serbian)
  3. PARTICULATE EMISSION TESTING OF UPGRADED ESP - TPP NIKOLA TESLA A6 (308 MWe), NIV-LTE-479, Vinca, 2011. (in English)
  4. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP NIKOLA TESLA A1 (220 MWe), NIV-LTE 484, Vinca, 2011. (in Serbian)
  5. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP NIKOLA TESLA A2 (220 MWe), NIV-LTE 485, Vinca, 2011. (in Serbian)
  6. PARTICULATE EMISSION TESTING OF UPGRADED ESP - TPP NIKOLA TESLA A6 (308 MWe), NIV-LTE-486, Vinca, 2011. (in English)
  7. PARTICULATE EMISSION TESTING OF UPGRADED ESP - TPP NIKOLA TESLA A6 (308 MWe), ACCEPTANCE TESTING, NIV-LTE-490, Vinca, 2011. (in English)
  8. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP NIKOLA TESLA A4 (305 MWe), NIV-LTE 493, Vinca, 2011. (in Serbian)
  9. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP KOLUBARA A5 (110 MWe), NIV-LTE 493, Vinca, 2011. (in Serbian)
  10. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP KOLUBARA A4, NIV-LTE 494, Vinca, 2011. (in Serbian)
  11. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP NIKOLA TESLA A1 (200 MWe), NIV-LTE 517, Vinca, 2013. (in Serbian)
  12. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP KOLUBARA A5 (110 MWe), NIV-LTE 518, Vinca, 2013. (in Serbian)
  13. PARTICULATE EMISSION TESTING OF UPGRADED ESP - TPP NIKOLA TESLA B2 (670 MWe), NIV-LTE-522, Vinca, 2013. (in English)
  14. PARTICULATE EMISSION TESTING OF UPGRADED ESP - TPP NIKOLA TESLA B1 (670 MWe), NIV-LTE-524, Vinca, 2013. (in English)
  15. MEASUREMENT OF EMISSION - ESP PERIODICAL TESTING - TPP NIKOLA TESLA A1 (200 MWe), A1 (200 MWe) and A3 (300 MWe), NIV-LTE 527, Vinca, 2013. (in Serbian)
  16. ACCEPTANCE TESTING OF ESP – TPP KOSTOLAC B2 (348,5 MWe), NIV-LTE 528, Vinca, 2013. (in Serbian)
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17. PARTICULATE EMISSION TESTING OF UPGRADED ESP - TPP NIKOLA TESLA B1 (670 MWe), NIV-LTE-529, Vinca, 2013. (in English)
18. TESTING OF ESP – TPP KOSTOLAC B2 (348,5 MWe), NIV-LTE 531, Vinca, 2013. (in Serbian)
19. PARTICULATE EMISSION GURANTEE TEST-B OF UPGRADED ESP - TPP NIKOLA TESLA A6 (340 MW), NIV-LTE-534, Vinca, 2013. (in English)
20. PARTICULATE EMISSION GURANTEE TEST-B OF UPGRADED ESP - TPP NIKOLA TESLA B1 (670 MW), NIV-LTE-548, Vinca, 2014. (in English)

**(D) ACCEPTANCE TESTING OF AIR HEATER**

1. PERFORMANCE TESTING OF AIR HEATERS AT TPP TUZLA-5 (200 MWe), NIV-LTE 390-2, Vinca, 2008. (in Serbian)
2. ACCEPTANCE TESTING OF AIR HEATERS AT TPP KOSTOLAC B2 (348,5 MWe), NIV-LTE 474, Vinca, 2009. (in Serbian)
3. ACCEPTANCE TESTING OF AIR HEATERS AT TPP KOSTOLAC B1 (348,5 MWe), NIV-LTE 415, Vinca, 2009. (in Serbian)
4. ACCEPTANCE TESTING OF AIR HEATERS AT TPP KOLUBARA A5 (110 MWe), NIV-LTE 519, Vinca, 2012. (in Serbian)

**(E) VARIOUS STUDIES**

1. *P. Stefanović*: LABORATORY ANALYSES OF KOLUBARA LIGNITE REPRESENTATIVE SAMPLES, NIV-LTE 369, Vinca, 2008. (in Serbian)
2. *P. Stefanović*: NATURAL RADIOACTIVITY OF KOLUBARA LIGNITE (from Tamnava field) VERSUS MINERAL MATTERS CONTENT, NIV-LTE 402, 2009. (in Serbian)
3. *P. Stefanović*: EMISSION OF GREENHOUSE GASES FROM ELECTRIC POWER INDUSTRY OF SERBIA PLANTS (1990-2008), NIV-LTE 422, 2010. (in Serbian)
4. *P. Radovanović*: ANALYSES OF EVAPORATOR TUBES RUPTURE – TPP KAKANJ UNIT 7 (230 MWe), NIV-LTE 427, Vinca, 2010. (in Serbian)
5. *P. Stefanović*: INFLUENCE OF COAL ... ON TPP NIKOLA TESLA TECHNICAL EFFICIENCY AND ENVIRONMENTAL PROTECTION, NIV-LTE 458, 2010. (in Serbian)
6. *P. Radovanović*: POSSIBILITIES OF EVT N270.45 MILL OPERATION IMPROVEMENT IN ORDER TO DECREASE NITROGEN OXIDES EMISSION - TPP KOSTOLAC-B (2x348,5 MWe), NIV-LTE 457, Vinca, 2010. (in Serbian)
7. *P. Radovanović*: RESIDUAL LIFETIME ASSESSMENT OF BOILER DRUM – TPP MORAVA (125 MWe), NIV-LTE JITE 465, Vinca, 2010. (in Serbian)
8. *P. Stefanović*: NATURAL RADIOACTIVITY OF KOLUBARA LIGNITE VERSUS MINERAL MATTERS CONTENT, NIV-LTE, НИБ-ЈИТЕ 467, Vinca, 2010. (in Serbian)
9. *P. Stefanović et al.*: INITIAL NATIONAL COMMUNICATION OF THE REPUBLIC OF SERBIA UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE), ISBN: 978-86-7306-105-4, Belgrade, 2010. (in English and Serbian)
10. *P. Stefanović*: DRYING OF LIGNITE FOR SERBIAN THERMAL POWER PLANTS IN ORDER OF ENERGY EFFICIENCY AND ENVIRONMENTAL PROTECTION IMPROVEMENT, NIV-LTE 469, Vinca 2011.
11. *B. Grubor et al.*: SAMPLING AND ANALYSES OF LOW CALORIFIC COAL RESIDUES, BIOMASS AND COMBUSTIBLE INDUSTRIAL WASTE MATERIALS IN KOLUBARA MINE, NIV-LTE 495, Vinca, 2012 (in Serbian)
12. *P. Radovanović*: PRE-FEASIBILITY STUDY ON NECESSITY AND TECHNO-ECONOMICAL ASPECTS OF SOLID RECOVERY FUELS CO-COMBUSTION WITH COAL AT SERBIAN POWER PLANTS, NIV-LTE 500, Vinca, 2012 (in Serbian)
13. *P. Stefanović*: ANALYSES OF EVAPORATOR TUBES INNER SURFACES AFTER CHEMICAL CLEANING – TPP KOSTOLAC B2 (348,5 MWe), NIV-LTE 514, Vinca, 2012. (in Serbian)
14. *P. Radovanović et al.*: REVISION OF TPP BANOVICI (Bosnia and Herzegovina) 300 MWe BOILER DESIGN (with fluidized bed combustion), NIV-LTE 516, Vinca, 2013. (in Serbian)