ANJA KLARIN-HENRICSON

Born in 1949, citizen of Finland

Education

1974, M.Sc., Chemical and Physical Metallurgy and Chemical Engineering, Helsinki University of Technology, Finland

1977, Licentiate of Technology, Physical Metallurgy
Helsinki University of Technology, Finland

1981, Doctor of Technology, Chemical Metallurgy
Helsinki University of Technology

1982, Docent in Theoretical Process Metallurgy
Helsinki University of Technology

1993, MBA
Helsinki University of Technology

Current Position

Vice President, Operations Management

Languages

Finnish, Swedish, English, German, (Russian)

Specialty

Specialized in metallic and ceramic materials and their applications, especially in the pulp and paper industry. Widely speaking the deep specialization concerns materials at high temperatures.

1998, EWE (European Welding Engineer)
Lappeenranta University of Technology, Finland

Summary of Experience

2002 -

Dr. Anja Klarin-Henricson has worked since 2002 as a Vice President of Electrowatt-Ekono Oy, Finland, being responsible for the material, corrosion and lifetime management service business for the energy production and other industrial processes, in particular pulp and paper, welding and manufacturing industries. Over 30 years of professional career Mrs. Klarin-Henricson has developed major know-how in material selection and corrosion related issues, equipment inspections, failure analyses and lifetime estimates for equipment and industrial processes. Furthermore, Mrs. Klarin-Henricson has major experience in management of multidiscipline technology programmes (Tekes i.e. The National Technology Agency) programme “Clean Surfaces 2002-2006”. This programme was focusing on mechanisms of fouling (for instance in paper machines, boilers and heat exchangers) and soiling. The total budget of the programme was 25 million euros.
During the last two years Dr. Anja Klarin-Henricson has analyzed the risks

of several old and new power boilers, where co-combustion of diverse fuels takes place. These surveys consist mainly of CFB and BFB boilers, where many kinds of sludges, rejects and wastes are combusted together with/or without conventional fuels. Problems in combustion as well as the consequences in the life time of critical parts of the boiler are considered in these surveys.

1996-2002

Mrs. Klarin-Henricson began her career as a consultant in 1996 when she joined ÅF-IPK AB in Stockholm, Sweden. As from 1997 she worked as the head of the Materials Technology and Inspection Department of the company. During the years at ÅF Mrs. Klarin-Henricson carried out several inspections of digesters, boilers and other equipment in pulp mills e.g. in Argentine, Canada, Chile, Indonesia, Sweden and Finland. She was also involved in projects with various material problems concerning corrosion and welding in the pulp and paper industry. At ÅF Mrs. Klarin-Henricson contributed to create a failure bank for failures in Fibre Lines of Swedish and Norwegian pulp mills when she acted as the Secretary of the Fibre Line Committee (Fiberlinjekommittén) from 1978 to 2002. At ÅF Mrs. Klarin-Henricson also contributed to several publications in maintenance and material questions in the pulp and paper industry, including the Materials, Corrosion Prevention and Maintenance textbook published by TAPPI PRESS & Finnish Paper Industry Federation in 1999.

1989-1996

Mrs. Klarin-Henricson began her specialization in the pulp and paper industry when working as a technology manager at Ahlström Engineering (later Ahlstrom Machinery) from 1989 to 1996. During that time she specialized in materials and welding problems in the deliveries of Ahlstrom's workshops to the pulp and paper mills worldwide.

1986-1988

From 1986 to 1988 Mrs. Klarin-Henricson worked as a process manager at WP-Ceramics Ltd. This work with ceramic materials focused on applications of ceramics in different industries where materials with high wear resistance or heat resistance are needed.

1975-1985

From 1975 to 1985 Mrs. Klarin-Henricson worked as a scientist at the Institution of Process Metallurgy, Helsinki University of Technology. As a project manager she was involved in several research projects financed by Finnish or Swedish industrial companies and research organisations, such as Outokumpu Oy, Cormet Oy, Höganäs AB, Sandvik Coromant AB, Jernkontoret, SEV-Cooperation, EU-COST 503, SITRA.

Qualifications

During her career Mrs. Klarin-Henricson has been very active in research work. For example, she has contributed to dozens of publications in several papers in English, Swedish, Finnish or German (see attached list) and supervised about 20 master's theses and 5 licentiate's theses.

During her academic years Mrs. Klarin-Henricson received a Licentiate of Technology degree ("Material Flows in Sintering of Nickel" (1977) and a Doctor of Technology degree ("Chemical thermodynamics of direct lead

smelting" (1981) in Theoretical Process Metallurgy.

Mrs. Klarin-Henricson's knowledge of both chemical thermodynamics and behaviour of metals at high temperatures provides her with a comprehensive understanding of how to solve material problems in boilers. Further, this multidisciplinary theoretical background with her inspection experience qualifies her to solve high-temperature problems e.g. whether certain biofuels or wastes can be used as a fuel in boilers or not. Moreover, what kinds of problems these fuels may cause in the boilers in the short or long run.

Inspections

1996 - 1997	**Alto Parana S.A., Argentina** Recovery Boiler, Power Boiler, Evaporators Bleaching Units, Lime kiln
1996	**Celulosa del Pacifico S.A.- Planta Mininco, Chile** Recovery Boiler
	Chilgener S.A.- Nacimiento, Chile BFB Boiler
	CMPC Celulosa S.A.- Laja , Chile Recovery Boiler
1997	**Celulosa Arauco y Constitution, Chile** Continuous Digester and Recovery Boiler
1997 – 2007	**Stora Enso Laminating Papers, Kotka, Finland** Tanks in Fibre Lines 1 and 2, Evaporators, Zedivap Tanks at Paper Mill
1999 – 2006	**Sunila Oy, Kotka, Finland** Evaporators and some tanks
1999 – 2007	**Gruvön, Sweden** Evaporators
1999 – 2002	**Husum, Sweden** Evaporators
2001	**AssiDomän Frövi** Life time estimate of the pulp mill
2001	**Riau Pulp, Indonesia** Cracking in a hot white liquor accumulator

2002	**PT. TEL Pulp Mill, Musi Pulp, Indonesia** Corrosion of a Continuous Digester
2002	**Stora Enso Skoghall, Sweden** Inspection of a continuous digester
2004,2006	**Metsä-Botnia Äänekoski, Finland** Inspection of a Continuous Digester and BL Evaporators
2005	**Metsä-Botnia Kaskinen, Finland** Inspection of a Continuous Digester

Failure Analyses

Since 1974 more than 150 failure analyses for various industries and processes e.g. in metal manufacturing, in cementite carbide manufacturing, application of refractory and since 1989 mainly with respect to material problems in the pulp and paper industry.

The recent reference list of failure analyses includes the following :

- Batch Digesters (Sunila, Husum)
- Bleaching Units (Metsä-Rauma)
- Recovery Boilers (StoraEnso Uimaharju)
- Reboilers (SE Port Hawkesbury, Kaipola, Skogn)
- Boilers (Kivenlahti)
- Steam Dryers (Bäckhammars Bruk)
- Microbiological corrosion (Kiani Kertas, Indonesia)
- Cracking of duplex welds (Riau Andalan, Indonesia)
- Corrosion in Contininuous digesters (PT.TEL Musi Pulp, Ind., M-B Kemi, Sunila)
- Corrosion of a harvester (Normet Oy, Finland)
- Corrosion in water tubes (Kitee, Metsä-Botnia Kaskinen, Ruukki, M-real Kaskinen)
- Plugging in Waste Incinerators (Ekokem, Kent Enviropower)

Evaluations of Corrosion Risks and Lifetime Assessments on Boilers

Since 1974 several analyses for various industries on the risks of special circumstances in the running processes at higher temperatures. These evaluations are based both on thermodynamic calculations and on the deep knowledge of high-temperature steels and ceramics.
Some examples of these analyses includes the following :

- optimization of biofuels in power boilers (Polish Energy Partners, Schongau, Alholmens Kraft, Golbey)
- due diligence on power boilers and recovery boilers
- life time estimate based on process data and inspection history for a recovery boiler

Latest assessments :

ROOT CAUSE OF CORROSION IN AN AIR PREHEATER
Polish Energy Partners, Swicie, Poland
9.11.2006

PL2:N SAVUKAASUKANAVAN TUKKEUTUMINEN
(Root Cause of Plugging in a Flue Gas Duct)
Ekokem Oy Ab – Riihimäki, Finland
20.2.2007

PL2:N SAVUKAASUKANAVAN TUKKEUTUMINEN
Raportti 2: JPK:n lämpötilan lasku
(Root Cause of Plugging in a Flue Gas Duct: Temperature Decrease in an Afterburning Duct)
Ekokem Oy Ab – Riihimäki, Finland
2.4.2007

KLORIDIEN JA SUOLAHAPON AIHEUTTAMAT KORROOSIORISKIT KATTILASSA AK2
(Corrosion Risks due to HCl and Chlorides in the CFB Boiler)
Oy Alholmens Kraft Ab, Pietarsaari, Finland
23.4.2007

REMAINING LIFETIME ASSESSMENT OF SOG BFB
UPM-Kymmene Schongau Mill, Germany
20.6.2007

STRUCTURAL INTEGRITY EVALUATION OF NSG BFB
Norske Skog Golbey Mill, France
27.8.2007

CORROSION AND REPLACEMENT OF SUPERHEATERS
Allington Incinerator, England
19.11.2007

Maintenance / Availability /Life time estimate at pulp mills

1998, 1999 **Stora Enso Laminating Papers Ltd., Finland**
Life time analysis of fiber lines 2 and 1

1998 **Stora Enso Gruvön Mill, Sweden**
Life time estimate for the evaporation units

1999 **Vallviks Bruk, Sweden**
How to increase availability at a pulp mill

1999 **Sunila Oy, Kotka, Finland**
Life time analysis of the evaporator lines (5 & 6)

2000 **Stora Enso Norrsundet, Sweden**
Life time analysis for the recovery area

2000 **Frövi, Sweden**
Life time estimate for a pulp mill

Courses given by Dr. Anja Klarin-Henricson

1999 **Ahlstrom Machinery, Päivärinne, Finland**
Corrosion and welding of steels

1999 **Stora Enso Laminating Papers, Finland**
Corrosion in a pulp mill

1990 – 2004 **Several lectures on welding, maintenance management, material selection, corrosion, etc.**

1993 – 2007 **Lappeenranta University of Technology, Finland**
Two courses on corrosion in process and power industry
Every second year since February 1993
One course every year since January 2006.

Previous Experience

1996-2002 **ÅF-IPK, Helsinki, Finland**
Senior Consultant, Materials Technology and Inspection

1989-1996 **Ahlstrom Machinery, Helsinki, Finland**
Director of Technology Development

1986-1989 **WP-Ceramics Ltd., Helsinki, Finland**
Process Manager

Academy of Finland, Helsinki University of Technology
1982-1985 Senior Scientist
1980-1982 Junior Scientist
1979-1980 Scientist
Research fellow at the Helsinki University of Technology

1981 **Max-Planck-Institut fur Eisenforschung, Dusseldorf, Germany**
Visiting scientist for 3 months

Memberships

The American Metals Society, since 1975
The American Ceramic Society, since 1983
TAPPI Technical Association of Pulp and Paper Engineers, since 1994
The Finnish Corrosion Society, since 1989

The Finnish Mining and Metallurgy Society, since 1974
The Swedish Ceramic Society, since 1987
The Finnish Chemical Society, since 1980

IVA (The Royal Swedish Academy of Engineering Sciences)
(Member of Industrial Council of Academy) since 1989

Swedish Foundation for Strategic Research
Member (Vice chairman) of the Council, between 1993 and 1996
Member of the Technology Group (Base Technologies), between 1993 and 1998

VTT Manufacturing Technology, Finland
Member of the Advisory Board, between 1993 and 1997

Inspecta Oy, Finland
Member of the Board, in 1995-1996

Finnish Corrosion Society
Member of the Council, between 1996 and 1998

Finnish Maintenance Society
Member since 1996

Finnish Welding Society
Member since 1998

Publications

Publications of Anja Klarin-Henricson (ex Taskinen):
During the academic years (from 1975 to 1985 as Anja Taskinen and since 1986 as Anja Klarin)

1. M.H. Tikkanen, Anja Taskinen, Pekka Taskinen:
Investigation of Methods of Preparation of Cobalt Powders Suitable for Hard Metal Production, *Jernkontorets Forskning*, Serie D 105(1975)

2. Anja Taskinen:
Tutkimus jauhemetallurgisen koboltin valmistamisesta, *Tutkimus ja Tekniikka*, No 9 (1975) s. 54-57.

3. **M.H. Tikkanen, A. Taskinen, P. Taskinen:**
Characteristic Properties of Cobalt Powder Suitable for Hard Metal Production, *Powder Metallurgy*, Vol. 16 (1976) No 36, pp. 249-282.

4. M.H. Tikkanen, A. Taskinen, P. Taskinen, J. Laulumaa, A. Itäluoma:
Pilot-scale production and testing of Co powder intends for hard metal manufacture, *Jernkontorets Forskning*, Serie D 156 (1976).

5. M.H. Tikkanen, A. Taskinen, P. Taskinen
Development of Metal Phase during Reduction of Tungsten Oxides by Hydrogen,
Jernkontorets Forskning, Serie D 176 (1977).

6. M.H. Tikkanen, A. Taskinen, P. Taskinen:
Thermal Decomposition of Cobalt Oxalate, *Proc. 8th Int. Symp. On the Reactivity of Solids*, Plenum Press, (1977), 617-624.

7. A. Taskinen, P. Taskinen, S. Vuorinen, M.H. Tikkanen:
On the reduction of tungsten powder, *Scandinavian Journal of Metallurgy*, Vol. 6 (1977), 233-237.

8. Anja Taskinen:
Determination of the amount of α-phase in cobalt powder by X-ray diffraction, *Report TKK-V-B2* (1978).

9. A. Taskinen, T. Gustafsson and H. Kullberg:
Uraanidioksidin matalalämpötilasintraus, *Report TKK-V-C7* (1978).

10. P. Hytönen, A. Taskinen, M.H. Tikkanen:
Kolutfällningen katalyserad av smorda järnkutsar i CO-CO_2-H_2-H_2O-N_2-atmosfärer,
Jernkontorets Forskning, Serie D 240 (1978) 67 s.

11. Anja Taskinen:
Determination of the Amount of Hexagocal Phase in Cobalt Powder,
Scandinavian Journal of Metallurgy, Vol.7 (1978) No. 5, 193-195.

12. Pekka Taskinen, Anja Taskinen, Pentti Hytönen:
Thermodynamics of pyrometallurgical copper refining, Helsinki Univ. Of Technology, Inst. Of Process Metallurgy, *Report TKK-V-B8* (1979)

13. M.H. Tikkanen, A. Taskinen:
Oksidisen ydinpolttoaineen sintraus 1200-1400 ^oC:ssa, HUT Inst. Process Metallurgy, *Report TKK-V-C7* (1979).

14. A. Taskinen and H. Kullberg:
Oxygen Chemical Diffusion Coefficient in Hyperstoichiometric Uranium Dioxide, *Journal of Nuclear Materials*, C3 (1979) 333-334.

15. Anja Taskinen:
Thermodynamics and Solubility of Oxygen in Liquid Lead, *Scandinavian Journal of Metallurgy*, Vol.8 (1979) No. 5, s. 185-190.

16. Anja Taskinen and Pekka Taskinen:
Activity of Oxygen in Ternary Cu-Pb-O Alloys at 1100-1200^oC, *Zeitschrift fur Metallkunde*, Bd. 70 (1979) H.9.

17. A. Taskinen and M.H. Tikkanen:

Changes in the internal structure of carbonyl nickel during sintering, *Proc. Of the 5th European Symposium on Powder Metallurgy,* Stockholm 4-8.6.1978 (1979) Vol.2 (1979) s. 245-248.

18. Anja Taskinen:
Dislocation density in carbonyl nickel during sintering, *Journal of Materials Science,* vol. 15 (1980) 2253-2257.

19. Anja Taskinen and Hannu Holopainen:
Influence of Copper on the Activity Coefficient of Oxygen in Liquid Lead, *Zeitschrift fur Metallkunde,* Bd. 71 (1980) H.11, 729-734.

20. A. Taskinen and M.H. Tikkanen:
A New Method for Studies of Lubricant Decomposition Phenomena During Sintering, *Scandinavian Journal of Metallurgy***,** Vol.10 (1981) 35-38.

21. A. Taskinen, M.H. Tikkanen and G.B. Bockstiegel:
Carbon Deposition in Iron P/M Compacts During the Delubrication Process, *Jernkontorets Forskning,* Serie D 342 (1980) 23s.

22. A. Taskinen, M.H. Tikkanen and G.B. Bockstiegel:
Carbon Deposition in Iron P/M Compacts During the Delubrication Process, *Scandinavian Journal of Metallurgy*, Vol.10 (1981), 55-62.

23. A. Taskinen and M.H. Tikkanen:
A new method for studies of lubricant decomposition phenomena during sintering, *Jernkontorets Forskning,* Serie D 348 (1981) 15 s.

24. Anja Taskinen:
Nickel in liquid Pb-O-Solutions, *Scandinavian Journal of Metallurgy*, Vol.10 (1981), 185-188.

25. Anja Taskinen:
Silver-Oxygen and Gold-Oxygen Interactions in Dilute Molten Lead Alloys, *Scandinavian Journal of Metallur***gy**, Vol.10 (1981), 141-144.

26. Anja Taskinen and M.H. Tikkanen:
Carbon deposition in iron P/M compacts during the delubrication process, *Modern Developments in Powder Metallurgy*, Vol. 15 (1981) p. 3-25.

27. Anja Taskinen:
Oxygen-metal (Ag, Au, Bi, Cu, In, Ni, Sb, Sn, Te) interactions in dilute molten lead alloys, Thesis for the degree of Doctor of Technology, *Acta Polytechnica Scandinavica*, Ch 146 (1981) 44 p.

28. Pekka Taskinen, Anja Taskinen and Lauri E. Holappa:
Activities in Pb-MgO-SiO_2 Melts by EMF Technique, *Scandinavian Journal of Metallurgy*, Vol.11 (1982), 17-22.

29. Anja Taskinen:

Activity coefficient of oxygen in Pb-Bi and Pb-Sb melts, *Zeitschrift fur Metallkunde*, Bd. 73 (1982) H. 3, 163-168.

30. Anja Taskinen and Kosti Jylhä:
Influence of arsenic on the activity coefficient of oxygen in liquid lead, *Scandinavian Journal of Metallurgy*, Vol.11 (1982), 158-160.

31. Anja Taskinen:
Effect of In, Sn, and Te on the activity coefficient of oxygen in liquid lead, *J. Chem. Thermodynamics*, vol. 14 (1982), 663-670.

32. Pekka Taskinen, Anja Taskinen and Lauri E. Holappa:
Solution thermodynamics of PbO-CaO-SiO_2 melts, *Canadian Metallurgical Quarterly*, vol. 21 (1982) No. 2, 163-169.

33. R. Suhonen, A. Taskinen and M.H. Tikkanen:
Wear Resistance of Sintered Steels, Research project no. 8036/81, *Jernkontorets Forskning*, Serie D 418 (1982).

34. Anja Taskinen, Kosti Jylhä and Lauri Holappa:
Sooda raudan ja teräksen raffinoinnissa, HUT Institution of Process Metallurgy, *Report TT-V-C24* (1982).

35. Seppo Kemppainen, Anja Taskinen and Lauri Holappa:
Rautapohjaisen komposiitin sintraus, HUT Institution of Process Metallurgy, *Report TT-V-C27* (1982).

36. Anja Taskinen and Lauri E. Holappa:
An empirical correlation between enthalpy and entropy interaction coefficients, *Calphad*, Vol. 6 (1982) No 4, 293-296.

37. Tuija Suortti and Anja Taskinen:
Phase Diagrams of Binary Pb-Systems, HUT Institution of Process Metallurgy, *Report TKK-V-B19* (1983) 173p.

38. A. Taskinen, M.H. Tikkanen and K. Lilius:
Refractories in Lead Furnaces, *Jernkontorets Forskning*, Serie D, Nr. 416, (1982), 45 s.

39. A. Taskinen:
Effect of cobalt on the activity coefficient of oxygen in lead, *Zeitschrift fur Metallkunde*, Bd. 74 (1983) H. 2, 74-75.

40. A. Taskinen and T. Suortti:
Sulphur-Oxygen Interactions in Dilute Lead Melts, *Scandinavian Journal of Metallurgy*, Vol.12 (1983), 93-95.

41. A. Taskinen, M.H. Tikkanen and K. Lilius:
Penetration of lead slags into refractories, *Jernkontorets Forskning*, Serie D, Nr. 442, (1983), 25 s.

42. J. Härkki, Y. Julin, K. Jylhä and A. Taskinen:
A literature survey on first-order interaction coefficients in ferrous alloys, HUT Institution of Process Metallurgy, *Report TKK-V-B***22** (1983) 46p.

43. Anja Taskinen and Dieter Janke:
Schlackenvorbehandlung zur gleichzeitigen Entphosphorung and Entschwefelung von Roheisenschmelzen, *Stahl und Eisen*, vol. 103 (1983) Nr. 10, 491-496.

44. Anja Taskinen, Kosti Jylhä and Lauri Holappa:
Soda in the refining of hot metal ans steel, HUT Institution of Process Metallurgy, *Report TKK-V-B23* (1983) 127p.

45. Pekka Taskinen and Anja Taskinen:
Hapen liukeneminen metallisuliin, *Vuoriteollisuus – Bergahanteringen*, 41 vsk. (1983) No 1, 39-45.

46. A. Taskinen, H. Tonteri and L. Holappa:
Powder flow properties and condition agents, *Jernkontorets Forskning*, Serie D, Nr. 454, (1983), 32 s.

47. Anja Taskinen:
A way to measure infiltration of slags into refractories, *Scandinavian Journal of Metallurgy*, Vol.12 (1983), 195-197.

48. A. Taskinen, M.H. Tikkanen and K. Lilius:
Effect of soda on the wear of refractories, *Jernkontorets Forskning*, Serie D, Nr. 453, (1983), 32 s.

49. A. Taskinen:
Röntgendiffraktion käyttö metallurgisessa tutkimuksessa, Metallurgiset tutkimusmenetelmät, Toim. Antti Roine, HUT Institution of Process Metallurgy, *Report TKK-V-C31* (1983), 81-95.

50. A. Taskinen and L. Toivonen:
Activities in PbO-ZnO-SiO_2 Melts, *Scandinavian Journal of Metallurgy*, Vol.13 (1984), 7-10.

51. A. Taskinen, K. Keskinen and K. Lilius:
Interfacial Tension between Lead and Lead Silicates, *Scandinavian Journal of Metallurgy*, Vol.13 (1984), 11-14.

52. J. Härkki, Y. Julin, K. Jylhä and A. Taskinen:
A literature survey on first-order interaction coefficients in ferrous alloys, *Jernkontorets Forskning*, Serie D, Nr. 488, (1984), Forskningsuppgift nr. 2102/82.

53. A. Taskinen, M.H. Tikkanen and K. Lilius:
Lead Silicate and Soda Slag Attack on Refractories, *Jernkontorets Forskning*, Serie D, Nr. 493,(1984), Forskningsuppgift nr. 6120/82.

54. Anja Taskinen and Matti H. Tikkanen:

Wear resistance of sintered steels, *Jernkontorets Forskning*, Serie D, Nr. 494, (1984), Forskningsuppgift nr. 8036/81, 30s.

55. Tuija Rytkönen, Anja Taskinen and Kaj Lilius:
Epäpuhtauksien käyttäytyminen suorassa lyijyn valmistuksessa, HUT Institution of Process Metallurgy, *Report TKK-V-C*41 (1985).

56. Anja I. Taskinen, Lasse M. Toivonen and Timo T. Talonen:
Thermodynamics of slags in direct lead smelting, *Second International Symposium on Metallurgical Slags and Fluxes*, Nov. 11-14 (1984) Lake Tahoe, Nevada USA Edited by H. A. Fine and D.R. Gaskell.

57. A. Helle, A. Taskinen and K. Lilius:
Zirkoniapohjaisten konstruktiomateriaalien valmistus, HUT Institution of Process Metallurgy, *Report TKK-V-C48* (1985).

58. I. Penttilä, A. Taskinen and K. Lilius:
Keraamisten materiaalien valmistustekniikka. Osa 1: Jauheen käsittely, HUT Institution of Process Metallurgy, ***Report TKK-V-C45*** (1985).

59. I. Penttilä, A. Taskinen and K. Lilius:
Keraamisten materiaalien valmistustekniikka. Osa 2: Jauheen kompaktointi, HUT Institution of Process Metallurgy, *Report TKK-V-C47* (1985).

60. P. Soininen, J. Vehmaan-Kreula and A. Taskinen:
Piipohjaisten konstruktiokeraamien valmistus, HUT Institution of Process Metallurgy, *Report TKK-V-C51* (1985) 160s.

61. T. Jämsä, A. Taskinen and K. Lilius:
Keraamisten materiaalien valmistustekniikka; Selvitys laitteista ja niiden toimittajista, HUT Institution of Process Metallurgy, *Report TKK-V-C57* (1985) 30s.

62. S. Kemppinen, A. Taskinen and L. Holappa:
Rautapohjaisen komposiitin sintraus, HUT Institution of Process Metallurgy, *Report TKK-V-C52* (1985) 46s.

63. H. Manninen, A. Taskinen and K. Lilius:
Reduction of lead slags, Literature survey for research project 6129/84, *Jernkontorets Forskning*, Serie D, Nr. 571, (1985), Forskningsuppgift nr. 6129/84.

64. Klarin Anja:
Maintenance in the Pulp and Paper Industry,
MBA Thesis, Helsinki University of Technology, Oct.1993, 79p.

65. Klarin A., Westermarck J., Yläsaari S., Aromaa J. and Forsen O.:
Corrosion of Stainless Steels in Kraft Process Liquors, *Proceedings on the 12th International Corrosion Congress*, Sept.19-24, 1993, Houston, Texas, USA, 832-848.

66. Klarin A., Westermarck J. and Aromaa J.:
Dynamic sulphur equilibria in black liquors, *Paperi ja Puu- paper and Timber*, vol. 76, No 8, 1994, 487-490.

67. Klarin Anja:
Corrosion of evaporators in mill closure, *Paperi ja Puu- Paper and Timber*, vol. 76, No.6-7, 1994, 406-408.

68. Klarin Anja:
Floor tube corrosion in recovery boilers, *Tappi Journal*, vol.76, 1993, Dec., 183-188.

69. Klarin Anja:
Effect of mill closure on the corrosion of evaporators, *International Chemical Recovery Conference*, Toronto, 1995, A279-A282.

70. Klarin Anja and Pehkonen Antero,
Materials in Ozone Bleaching, *Proceedings of the 8th International Symposium in Corrosion in the Pulp and Paper Industry*, Stockholm, Sweden, May 16-19, 1995, 96-103.

71. Klarin Anja and Mäkipää Martti,
Smelt Composition and Floor Tube Corrosion, *10th Latin American Recovery Congress*, Conception, Chile, August 26-30,1996

72. Klarin Anja and Kottila Mika:
Caustic Corrosion in Black Liquor Evaporators, *Proceedings of the TAPPI Engineering Conference*, Chicago,IL,USA, Sept. 16-19,1996, 299-306.

73. Klarin Anja:
Corrosion of austenitic stainless steels in bleaching filtrates, *Paperi ja Puu- Paper and Timber*, vol.78, No.8, 1996, 451-455.

74. Klarin Anja:
Materialval i nedre delen av eldstaden, Föredrag, *Sodahuskonferensen 97*, Stockholm, 19.11.1997, ÅF-IPK AB

75. Klarin, Anja and Bruno, Fredrick and Lumme, Janne:
Failure cases from recovery boilers, *Technology, Law and Insurance*, 1998, No 3, 47 - 51.

76. Klarin, A., Mäkipää, M. and Bruno, F.:
Problems with Composite Floor Tubes in Recovery Boilers, *9th Int. Symposium in the Pulp and Paper Industry*, May 26-29, 1998, Ottawa, Ontario, Canada, 177-184.

77. Klarin, A., Mäkipää, M. and Bruno, F.:
Problems with Composite Floor Tubes in Recovery Boilers, *12th Congreso Latino-americano de Plantas de Recuperacion*, Puerto Iguazu, 24 al 28 de agosto de 1998, Misiones, Argentina, 8 s.

78. Klarin, Anja ja Lumme, Janne:
Korroosion hallinta puunjalostusteollisuudessa, (Corrosion Control in the Pulp and Paper Industry), Suomen Korroosioyhdistyksen Juhlaseminaari, Finnish Corrosion Society, Seminar, 27.8.1998, Otaniemi, Espoo, 9 s.

79. Klarin, Anja:
Justifying better material with Life Cycle Cost methodology, *Paper Industry Maintenance Europe 98*, 5-6 Nov. 1998, Amsterdam, PPI, Miller Freeman

80. Klarin, A., Mäkipää, M. and Bruno, F.:
Problems with Composite Floor Tubes in Recovery Boilers, *Pulp & Paper Canada*, vol. 100 (1999), No7, T237-T240.

81. Aromaa, Jari and Klarin, Anja:
Materials, Corrosion Prevention and Maintenace (BOOK),
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