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**TECHNO-ECONOMIC ANALYSIS OF
THE SCR PLANT FOR NO_x ABATEMENT**

Investigation into the Optimisation Potential of
Catalyst Renewal Strategies in SCR Plants

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Dissertation

Karlsruhe, 1993

Preface

When stringent emission standards needed to be implemented in Germany within a very short time, the SCR technology (Selective-Catalytic-Reduction) had to be adapted and in 1985 the first European SCR plant went into operation. An initial result of this very rapid transfer were partly inadequate plant layouts, frequent non-optimal plant operation and especially high catalyst prices compared to today. This pointed to an optimisation potential in terms of cost savings. Considering an investment capacity of 100 million DM for an 800 MW electric plant, of which 30 % are attributable to the catalyst, a projection for the installed SCR capacity in the UN-ECE region (of 50,000 MW electric at the end of 1993) gives annual costs for the catalyst alone of about 0.5 billion DM.

The aim of this study was the development of an instrument by which optimal and practical catalyst designs and replacement strategies for the SCR process could be determined. Apart from evaluating the operational experience with special regard to the catalyst deactivation behaviour over time, an economic model of the SCR technology was, for the first time, developed and applied, showing, as one of the main results, that a cost savings potential up to about 30 % is actually given.

This study is based on an UN-ECE research project which per order of the German Environmental Protection Agency was carried out at the Institute of Industrial Production, University of Karlsruhe (TH), in the years 1989 to 1992.

I would like to express my sincere thanks to Prof. Dr. O. Rentz for both the scientific and institutional support he gave, thereby enabling this thesis to be completed. I wish also to acknowledge Prof. Dr. H.-G. Lintz and Prof. Dr. G. Bol for their comments, suggestions and recommendations during the evaluation of this work.

I am grateful to my colleagues for the useful discussions and their friendly assistance. Special thanks are due to Dipl.-Wi. Ing. Thomas Spengler. I am also grateful to a number of companies, organisations and institutes which proved helpful with material and comments.

I also wish to thank Marcus Nicolai for his professional and emotional support which were a valuable aspect in accomplishing this work.

Finally, I thank my sister, my relatives and friends for the moral encouragement I received during the last years. I especially thank my mother and my father for their devout and personal support.