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**TO ALL MEMBERS OF THE TECHNICAL SUB-COMMITTEE AND COMMITTEE**

**JOINT MEETING OF THE TECHNICAL SUB-COMMITTEE AND COMMITTEE OF IFA**

# PAPERS PRESENTED AT THE TECHNICAL SESSION

held on Tuesday, 3 October 1995
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FERTILIZER FEEDS THE WORLD

# EFMAs BEST AVAILABLE TECHNIQUES: AN UPDATE[1]

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## THE EFMA BAT BOOKLETS

At the IFA Technical Conference in Amman a year ago I introduced you to the work EFMA was doing in establishing guidelines, or should I say the position of the European Fertilizer Industry, on what we consider Best Available Techniques (BAT) and achievable environmental emission levels for our main production processes. The work has been completed and EFMA has published 8 booklets, made as a team effort by many technical experts of the member companies of EFMA. Let me summarize what the booklets contain:

1. They cover the production processes of the following products:

   Booklet 1 Ammonia
   Booklet 2 Nitric acid
   Booklet 3 Sulphuric acid
   Booklet 4 Phosphoric acid
   Booklet 5 Urea and UAN
   Booklet 6 AN and CAN
   Booklet 7 NPKs by the nitrophosphate technology
   Booklet 8 NPKs by the mixed acid route

2. They describe the production processes in operation today and what we consider the best technologies for minimizing emissions, but taking due account of what is feasible costwise and whether the technology is available for the industry in general.

3. They give achievable emission levels to air and water, and quantity of wastes, all of which in our opinion should be the basis for future operational permits being issued by the environmental authorities. Some of the booklets, and in particular the one on ammonia production, also include achievable energy consumption figures. Production processes operating above these levels would in our opinion not qualify for the term Best Available.

   The emission levels given in the booklets have, to some degree, also been considered from the "integrated" concept. We have concluded the best "balance" between the emissions, wastes and energy consumption, based on the concept that a reduction of one emission may give an increase in another or a higher energy consumption. We should, however, be aware that local environmental conditions may require a different "balance", which should be reflected in the operational permit.

4. The booklets give two sets of BAT emission levels: one for new buildings and another for plants that have been in operation for some time (say built before 1990). The attached table gives an overview of the achievable emission levels concluded by EFMA.

   The principal reasoning for giving two sets of emission figures is that for new plants modern prevention technology can be readily integrated into the process design (and less emissions can be obtained in a cost efficient manner), whilst for existing plants emission reductions can only be done by installing end-of-pipe technologies or through costly process revamps.

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[1] *Presented at the IFA Technical Committee meeting in Prague, Czech Republic on 3 October 1995*

5. I said above that these emission levels ought to be the basis for future permits. I need to qualify this a little: The levels should be used as a level, or yardstick for what can be achieved. In setting the final permit, deviations may be accepted in case of the following:

   (1) if the environment can sustain the higher emissions, without negative effects locally, inter-regionally, nor globally

   (2) if the social costs of requiring BAT is too high

   (3) if the size of the production process, the availability of energy sources and raw materials, or the product range being manufactured, are different from what is assumed in the booklets.

6. We also make a recommendation to introduce the "bubble" concept when setting permits. This approach will enable the industry to find solutions for pollution control which are cost effective and at the same time integrated with other improvement activities.

## ARE WE IN A HEALTHY CONDITION?

We did not make an overall survey of all the EFMA member plants, so I cannot tell you whether we meet our own BAT emission levels. We did, however, request each member company to confirm their acceptance of the BAT levels with a commitment to reach compliance by year 2005. This we achieved, and we are well aware that some plants will have a considerable job to do to reach these levels.

So also for my company Hydro Agri Europe with 13 production plants throughout Europe. But we have a clear commitment to stay in the fertilizer business. Therefore we will continue to invest substantial resources in upgrading and modernizing our plants. Next year we will be spending some 20 mill ECU in making our production facilities more safe and environmentally friendly. The immediate return on investment is not evident, but it will make us more competitive long term.

## WHAT HAS HAPPENED TO THE BAT BOOKLETS?

EFMA's BAT booklets was issued this year and given a selective distribution: The fertilizer industry was given copies, the European Commission, and national and local authorities around our plants. We did not venture into a big PR-exercise, primarily because we wanted to further our good working relationship with the European Commission and together with them and national authorities establish Euro-BATs. So the EFMA booklets should be considered as a means in that process.

We had informal consultations with EU's Environment Directorate (DG XI) throughout the two years we used to develop the BAT booklets. Their reactions to our approach were positive and we were praised for our initiative. Parallel to our work, the Commission made progress on finalising the IPPC directive (Integrated Pollution Prevention and Control), which is the basis for establishing BAT in the first place. The member countries of EU have still to approve the directive. Some fundamental issues remain:

(1) should future permitting be based solely on BAT (German opinion) or should local environmental quality standards have a moderating effect

(2) there needs to be a whole range of Euro-BATs to be developed

(3) many environmental quality standards need to be defined.

So it is on defining Euro-BATs for the fertilizer industry we have taken an initiative. The success of the IPPC directive depends on a common understanding and agreement on what is BAT. This can best be achieved through a co-operative work between the commission, national authorities and the industry.

The Commission has now taken the initiative for such a constructive co-operation. They are using their research centre in Seville as a moderator, and have selected ammonia production and nitric acid production as a starter for Euro-BATs, in order to develop guidelines on how future BATs should be developed and described. We have been invited to take active part in the discussions together with national authorities. The second joint meeting will take place by the end of October.

**WILL OUR BAT BOOKLETS BECOME EURO-BATs?**

We will work for this aim, and the whole European fertilizer industry is backing up this process. We must, however, expect to have to defend our position on the emission levels. We already see that some national authorities will propose lower values, and they will make reference to plants that achieve better results than we have set as achievable levels. We can also find such examples, but one must keep in mind the very meaning of the word "available". A specific technology may not be commercially available to others, or not suited to the processes adopted in other units, or the revamp costs will be excessively high for others, or the basic operating conditions may be different. In addition, the degree of integration with other manufacturing units may give specific advantages. And perhaps differences occur simply because the methods for emission measurement and analysis vary from country to country.

I can see we have a lot of discussions to go through.

**Achievable Emission Levels for the European Fertilizer Industry**
(from the EFMA BAT Booklets 1995; numbers not in brackets = for new plants; inside brackets = for existing plants)

| Production process | Type of emission | ppmv | mg/Nm³ | mg/l | kg/t of product |
|---|---|---|---|---|---|
| Ammonia | $NO_X$ to air | 75 (150) | 150 (300) | | 0.45 (0.9) |
| | $SO_2$ to air | as for combustion plants | | | |
| | $NH_3$ to water | | | | 0.1 (0.1) |
| | Spent catalysts | | | | 0.2 (0.2) |
| | Energy consumption: 32.5 GJ/t $NH_3$ (for new reforming plants) | | | | |
| Nitric acid | $NO_X$ to air | 150 (400) | 300 (800) | | 1.6 (4.2) (of 100%) |
| Sulphuric acid | $SO_2$ to air | | | | 2-4 (10) |
| | $SO_3$ to air | | | | 0.15 (0.6) |
| Phosphoric acid | Fluoride to air | | 5 (30) | | 0.04 (of $P_2O_5$) |
| | Dust/particulates | | 50 (150) | | |
| | Gypsum re-use or disposal on land (for existing plants gypsum disposal to water may continue if accepted by Environmental Quality Standards) | | | | |
| Urea | Granulator Urea dust<br>$NH_3$ to air | <br>75 (250) | 50 (80)<br>50 (165) | | 0.25 (0.4)<br>0.25 (0.83) |
| | Prill tower Urea dust<br>$NH_3$ to air | <br>75 (150) | 50 (150)<br>50 (100) | | 0.5 (1.5)<br>0.5 (1.0) |
| | Vents $NH_3$ to air | | | | 0.06 (0.75) |
| | Urea to water | | | 1 (150) | 0.0005 (0.1) |
| | $NH_3$ to water | | | 5 (150) | 0.0025 (0.1) |
| Ammonium nitrate | Granulator/prill tower<br>Particulates<br>$NH_3$ to air | | <br>15 (15)<br>10 (10) | | total to air<br>particulates: 0.5 (0.5)<br>$NH_3$: 0.2 (0.2) |
| | Neutraliser/cooler/drier<br>Particulates<br>$NH_3$ to air | | <br>30 (30)<br>50 (50) | | |
| | With insol. solids/ CAN<br>Particulates<br>$NH_3$ to air | | <br>50 (50)<br>50 (50) | | |
| | N to water | | | 100 (100) | 0.2 (0.2) |
| NPK, nitrophosphates | $NH_3$ to air | | 50 (250) | | 0.3 (1) |
| | $NO_X$ to air ($NO_2$) | | 500 (500) | | 0.2 (0.2) |
| | Fluoride to air | | 5 (5) | | 0.02 (0.02) |
| | Dust | | 50 (50) | | 0.3 (0.3) |
| | $P_2O_5$ to water | | | 30 (28) | 0.06 (0.11) |
| | $NH_4$-N to water | | | 60 (120) | 0.12 (0.5) |
| | $NO_3$-N to water | | | 15 (150) | 0.03 (0.3) |
| | Fluoride to water | | | 26 (13) | 0.05 (0.05) |
| NPK, mixed acids | $NH_3$ to air | | 50 (50) | | 0.2 (0.2) |
| | $NO_X$ to air ($NO_2$) | | 70 (70) | | 0.3 (0.3) |
| | Fluoride to air | | 5 (5) | | 0.02 (0.02) |
| | Dust | | 50 (50) | | 0.2 (0.2) |
| | N to water | | | 0 (100) | 0 (0.2) |