

Regulatory Modeling: A Retrospective

Science vs. Consistency
Guidance, Regulations, Clearinghouse

WHY? & HOW?

Outline

- ▶ What was the impetus?
- ▶ What was our initially approach?
- ▶ What forced a change?
- ▶ What problems did we encounter & how did we response?
- ▶ What's similar about today?
- ▶ What's different today?
- ▶ Is our existing approach adequate?

DO WE NEED A NEW APPROACH?



Initial Impetus

▶ CAA 1970/1977

- It's an ambient air NOT emissions based ACT
- ∴ It's Modeling Centric– We needed to predict ambient concentrations to:
 - Demonstrate adequacy of SIPs ('70 CAA)
 - Demonstrate increment and Std. Attn – NSR/PSD ('77 CAA)
 - Implement GEP: Precluded reliance on monitoring ('77 CAA)
 - Determine Residual Risk: Air Toxic's end game ('77 CAA)
- Why NSPS, RACT, BACT, LEAR, MACT, etc?
 - Move forward quickly
 - Avoid creation of economic advantage

What Was Our Initial Approach?

- ▶ 1970 –1977
 - It was all about the BEST SCIENCE
 - Enter ORD: EPA contracted NOAA expertise:
 - Research
 - Application: ORD Model Applications Branch (Bruce Turner)
 - 10 Regional meteorologists
 - A staff of applied modelers to support the regions
 - OAQPS was marginally involved

THOSE WERE THE DAYS ---- FOR DICTATORS

- Each Regional Meteorologist had a FIEFDOM
- Similar situations in different regions where resolved differently BECAUSE:
 - Most arguments tended to fall **within the model's uncertainty**
 - Industry wasn't objective (advocacy science)
 - RM's had different opinions

▶ 1970 –1977 (cont.)

◦ ORD Response

- Airlie House Uncertainty Conference

- How do define model uncertainty?
- How can it be use by Decision Makers?
- David Ayers (NRDC): Use the best science available and then “AGREE TO AGREE”
- RESULT: Decision Maker’s didn’t know what to do with it.

◦ IT DIDN’T WORK:

- The best science wasn’t enough (Best Estimate + Uncertainty) to implement a regulatory program
- Uncertainty was of little use to Decision Makers – they wanted a bright line

INCONSISTECY Reignied!!!!




What Forced Change?

- ▶ Our experience between 1970 & 1977
- ▶ The CAA 1977 (The Main Game Changer)
 - Enter PSD/NSR (Now even more important to avoid inconsistencies)
 - Enter Section 320: Standardize Air Quality Models
 - Conferences:
 - Hold one at least every three years.
 - Determine appropriate modeling to implement PSD in a consistent manner.
 - Conferees:
 - NAS, State and local agencies, NSF, NOAA, and other appropriate Fed Agencies
 - Comments & Transcripts:
 - Written & oral comments shall be taken and a transcript produced and archived.
 - Promulgate or revising regulations that promote consistency within the PSD Program

How Did We Respond?

- ▶ **Enter OAQPS**: Mandate for CONSISTENCY (this also included Equity)
 - Formed Air Quality Modeling Group (Joe Tikvart)
 - Recognized:
 - That a “Science Only” approach produces unworkable public policy
 - The need to Balance Science & Consistency
- ▶ **ORD Response:**
 - “...consistency is the hobgoblin of little minds...” (Ralph Waldo Emerson)
 - Tension begins between OAQPS & ORD

THE BATTLE WAS ON

- ▶ Implementation of Section 320 by OAQPS
 - Considerations:
 - Best science must be used within constraints
 - Decision timeframe
 - Availability of data
 - Capability of community
 - Approach needed to ensure consistency
 - It needed to be vetted by the community (rule making process).
 - Needed to allow for case specific decisions that avoided unwanted precedents
 - Needed to iteratively improve the science & approach to consistency
 - ▶ Developed a solicitation, evaluation and model selection process
 - ▶ Instituted the annual Regional Modeler's Meetings
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- ▶ Developed GAQM: Which included:
 - Preferred models
 - Flexibility to allow case-by-case decisions
 - Procedure for accepting non-guideline models
 - Procedures, methods & guidance designed to keep advocacy science in check (e.g. need to deal w/ 10⁰ winds)
- ▶ **Enter the Model Clearinghouse**
 - GAQM was found to be insufficient:
 - Needed to gather info, interpret the guidelines consistently, & improve, modify & evolve the models and the guidance
 - Worked well during the ISC ERA because:
 - Models were relatively simple
 - Lots of expert resources available
 - Industry was not yet up to speed
 - Politics was considerably less
 - However, success bred complacency during the 1990's.


What is Similar About Today?

- ▶ All the driving forces for consistency are still in place!
- ▶ We are still all in this together with the same roles, responsibilities & authorities. That is:
 - Only OAQPS has the authority/capability to:
 - Develop guidance & regulations
 - Organize the community of regulators
 - Inform and solicit public opinion
 - Improve &/or change models and implementation mythologies (AERMOD Imp. Guide, Met Guidelines, etc.)
 - Only States, Locals & sometime Regions issue permits
 - Only States & Locals can develop SIPs (FIPs???)
 - Only Regions approve SIPs
 - Only Regions can approve non-guideline models

WE ALL HAVE THE RESPONSIBILITY TO ENSURE
CONSISTENCY

What's Different About Today?

- ▶ **We are struggling to maintain consistency**
- ▶ More complicated models (Do we have the needed expertise?)
 - AERMOD is totally different from ISC:
 - Is it understood well enough for us to effectively implement?
 - Do we know why it predicts what it does?
 - Do we have an adequate feel for its sensitivity?
 - Do we know its strengths and weaknesses?
 - Can we adequately evaluate proposals by applicants?
 - Do we understand it well enough to effectively uncover gaming?
 - CALPUFF is ... (let's not get Bret started)
 - Need considerably more guidance and judgment

- ▶ Can we really Implement a formal clearinghouse process? Do we have the time and resources?
 - States & Regions(primary contact):
 - Evaluate the problem
 - Come to a decision
 - Justify that decision and insulate it from unwanted precedents
 - Write it up & wait for a decision
 - OAQPS:
 - Possibly vet through Regions and still produce a timely response
 - Evaluate implementation experience and improve guidance
 - Continue to improve the science (AERMIC) – WHERE IS ORD???
 - ▶ Industry is far better Informed and very politically connected
 - ▶ Different political climate
 - ▶ Academics (incl ORD): Back on the uncertainty kick
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What is the Best Approach for Today?

IF NOT WHAT WE HAVE BEEN DOING

THAN WHAT

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