Agenda:

- Capacity Planning Basics
- WFM Best Practices & Metrics
- Origins of the Erlang Method
- Interval Planning in the 21st century
- HD WFM Assumptions
- HD WFM Results
- More Leading Edge Concepts
  - Unconventional Wisdom
  - Lost Wisdom
  - Forecasting
  - Scheduling
  - Adherence
  - Shift Trading

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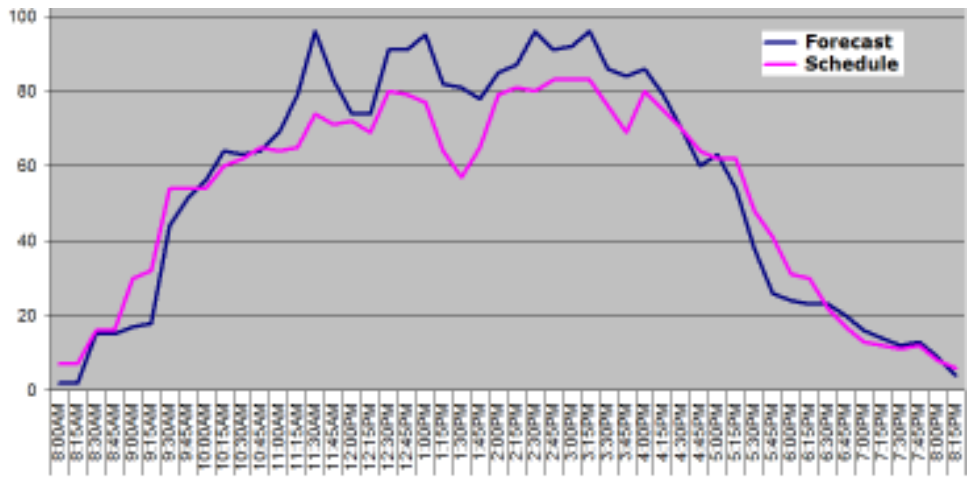
Capacity Planning Basics

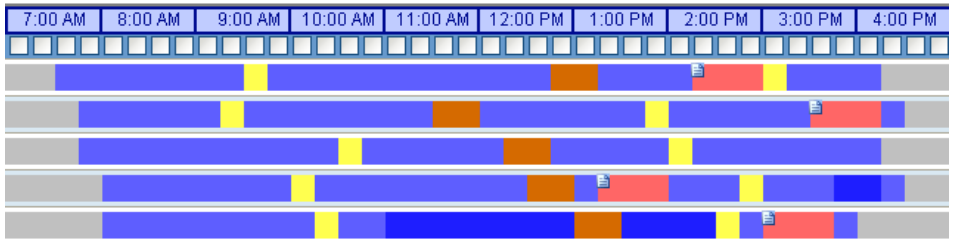
What is a Forecast:

- Forecast = Average workload from the past (plus a bit)
- Same day of week, same time of day
- Seasonality
- Holiday effects



What is a Schedule:

- Start times
- End times
- Breaks & Lunches
- Non-demand Activities



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WFM Best Practices & Metrics

Important Call Center Best Practices:

- Forecast. (using interval based method).
- Schedule to Forecast
- Reforecast Frequently
- Reduce Talk Times → Higher Productivity

Important Call Center metrics:

- Forecast Accuracy
- Service Levels
- Agent Adherence to schedule
- Agent Talk Times

WFM Best Practices & Metrics

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Poll Question:

- How many of the above items do you agree with?
  A. All B. Most C. Some D. None

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Call Center (ACD) Planning Basics

Average workload:

$$\text{Erlangs} = \frac{\text{Avg Talk Time} \times \text{Avg count of calls offered to queue}}{\text{Number of seconds to do the work}}$$

= Agents needed to do work at 100% utilization

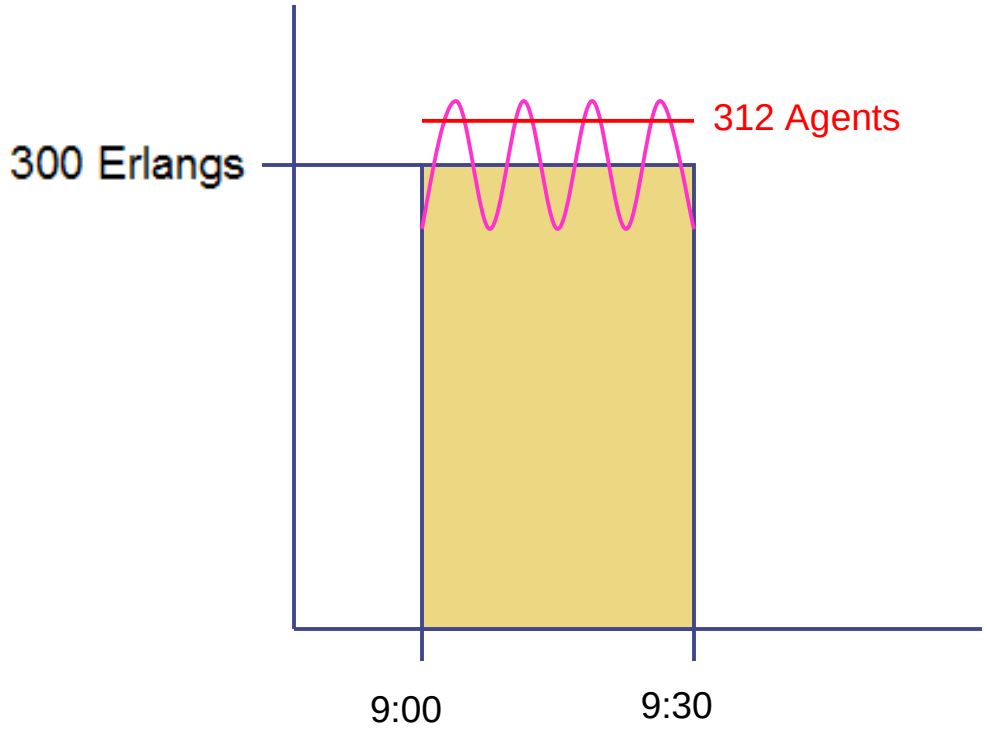
example:
10 minute Talk Time X 300 Calls / 30 minutes to do work = 100 Erlangs

Agents needed:

Requirements = Erlangs "plus a bit"
= fx(Erlangs, Target Service Level)
≅ Erlangs + 4% to 7% extra

Call Center (ACD) Planning Basics

Origins of the Erlang Method:

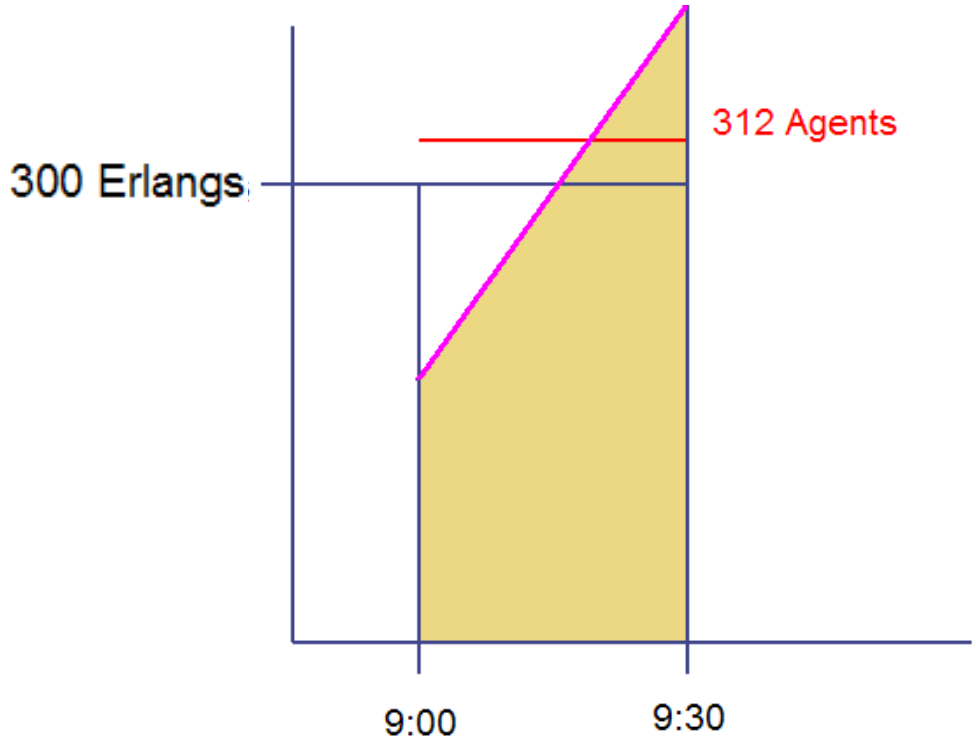


1909, Theory of Probability & Telephone Conversations

- Assumes random call arrivals

Call Center (ACD) Planning Basics

Origins of the Erlang Method:

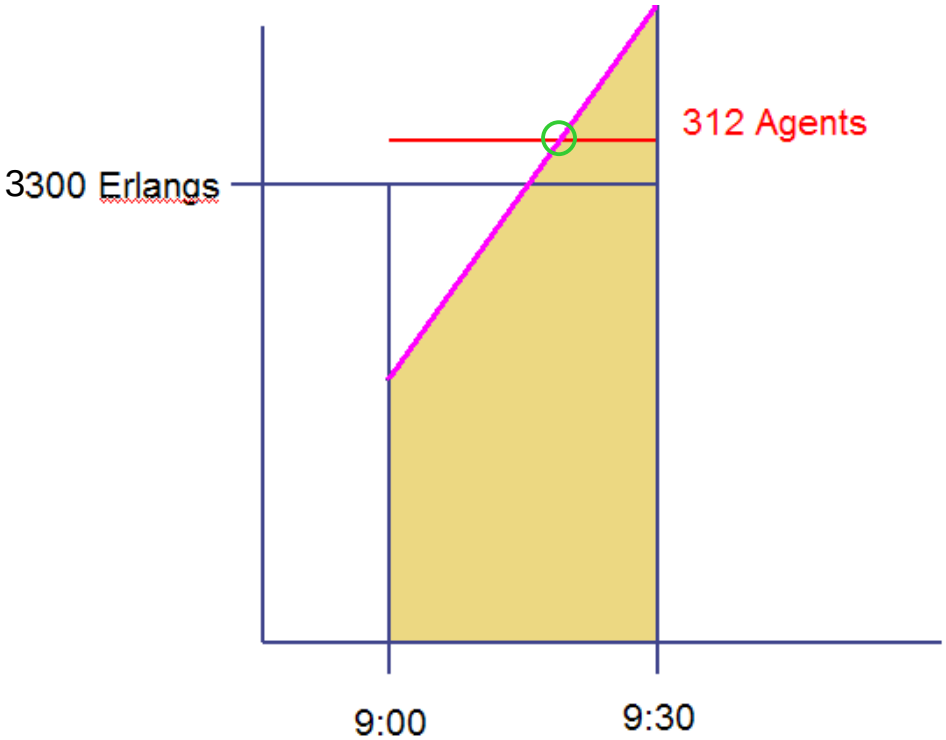


1909, Theory of Probability & Telephone Conversations

- Won't work for event driven activity

Call Center (ACD) Planning Basics

Origins of the Erlang Method:



1909, Theory of Probability & Telephone Conversations

- Won't work for event driven activity

Call Center (ACD) Planning Basics

Origins of the Erlang Method:

1909, Theory of Probability & Telephone Conversations:

- Won't work for event driven activity
- Ignores network bottlenecks
- Ignores busy signals
- "Interval based planning"
- Ignores carry over effects
- Ignores past wait times
- Don't know inter arrival times
- Method needs to be discarded & replaced
- Will some day create new method when inter arrival times can be known.

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Fast Forward to the 21st century

Progress:

- Erlang is Broadly used in every call center
- Erlang is Part of every commercial WFM solution
- Talk times and call counts automatically collected
- Forecasts calculated by computers (not tables)
- Create 20,000 schedules with a computer, automatically select the most optimal.
- WFM software also measures:
  - Agent conformance to schedule
  - Forecast accuracy
  - Labor utilization

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Example 1: December, 1999

First Net Zero National NBA Ad Campaign:

- 10,000 calls offered in less than 3 minutes
- 7000 network Busy signals
- 7x redial
- 50 Agents waiting
- 2 Agents talking to customers at peak of spike
- 20 calls handled
- 100% service levels
- No abandons
- No wait times
- Very expensive campaign
- Needed to be fixed or else

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Example 1: December, 1999

Luckily there was a WFM solution:

- To tell us how many agents we needed for the next event

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Luckily there was a WFM solution:

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Poll Question:

- How many agents?
  A. 1000 Agents
  B. 100 Agents
  C. 10 Agents
  D. 2 Agents

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Example 1: December, 1999

Luckily there was a WFM solution:

- To tell us how many agents we needed for the next event

Poll Question:

- How many agents?
  A. 1000 Agents
  B. 100 Agents
  C. 10 Agents
  D. 2 Agents

3 minute Talk Time X 20 Calls / 30 minutes to do work = 2

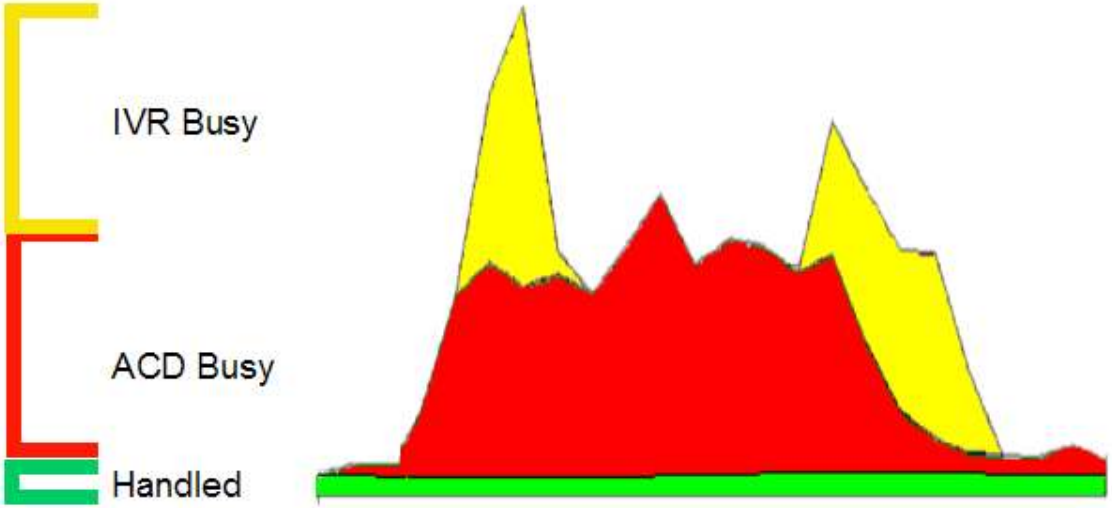
Capacity Based Planning!

Example 1: December, 1999

Erlang predicted this 80 years ago:

- Won't work for event driven activity
- Ignores network bottlenecks
- Ignores busy signals

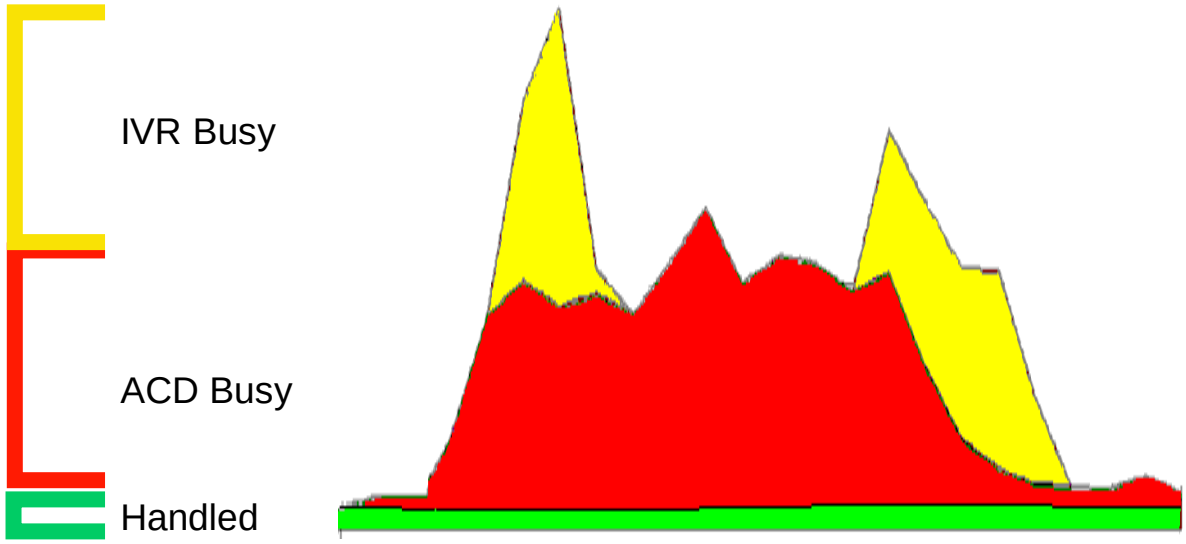
Example 2: February, 2003



A Distressed Call Center:

- 1200 Agents
- 9 out of 10 calls are busy signals
- 21 call centers in various cities & time zones
- Recent implementation of WFM in each site
- Time to fix the call centers costs

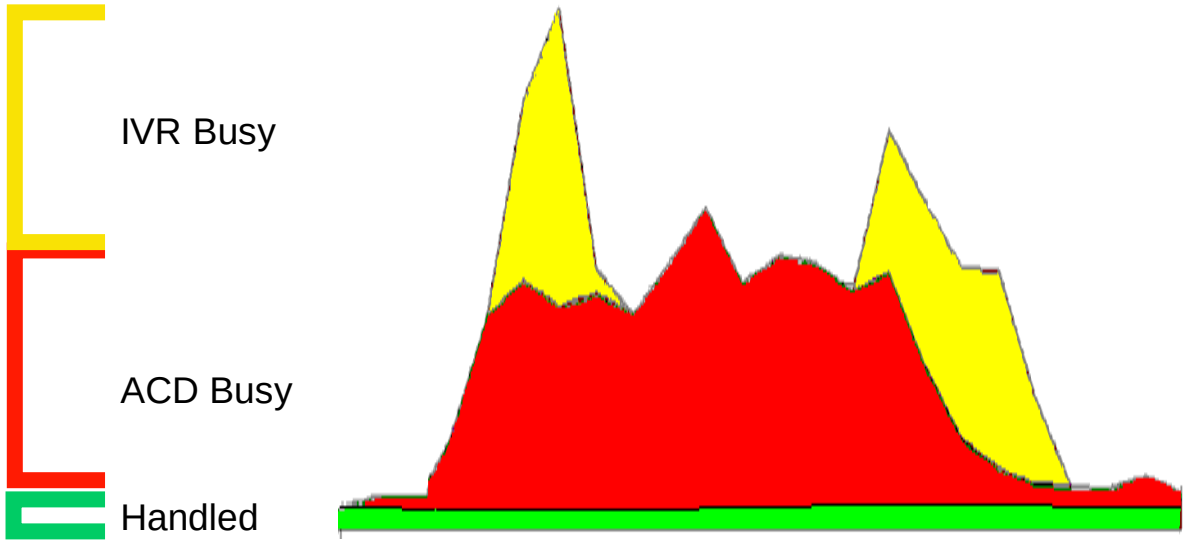
Example 2: February, 2003



Poll Question:

- Should the Call Center Lay-off Agents?
  A. Yes
  B. No

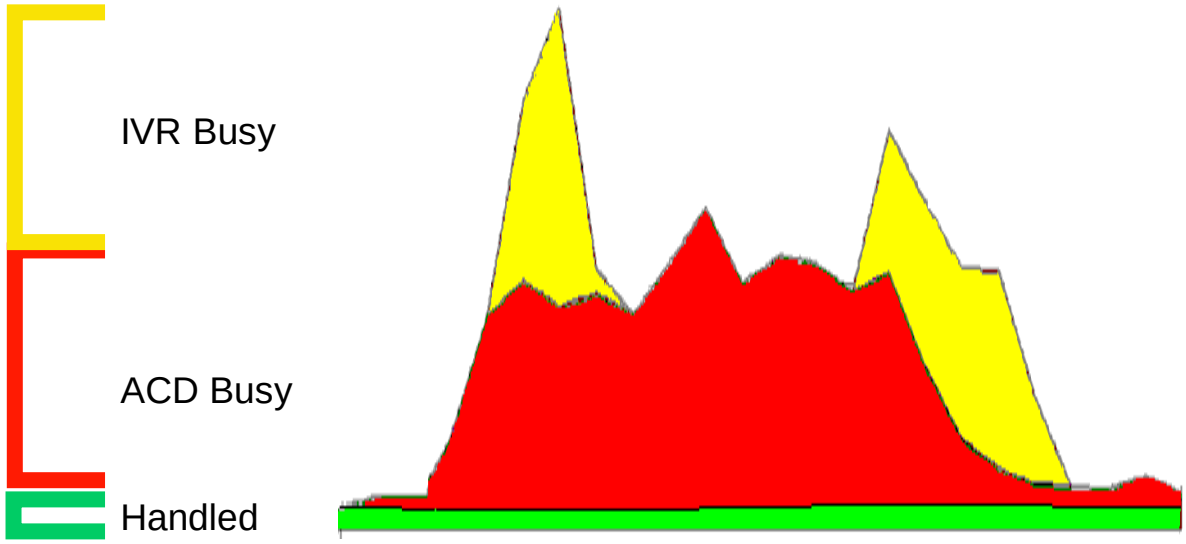
Example 2: February, 2003



Poll Question:

- How are the service levels?
  A. Good
  B. Bad

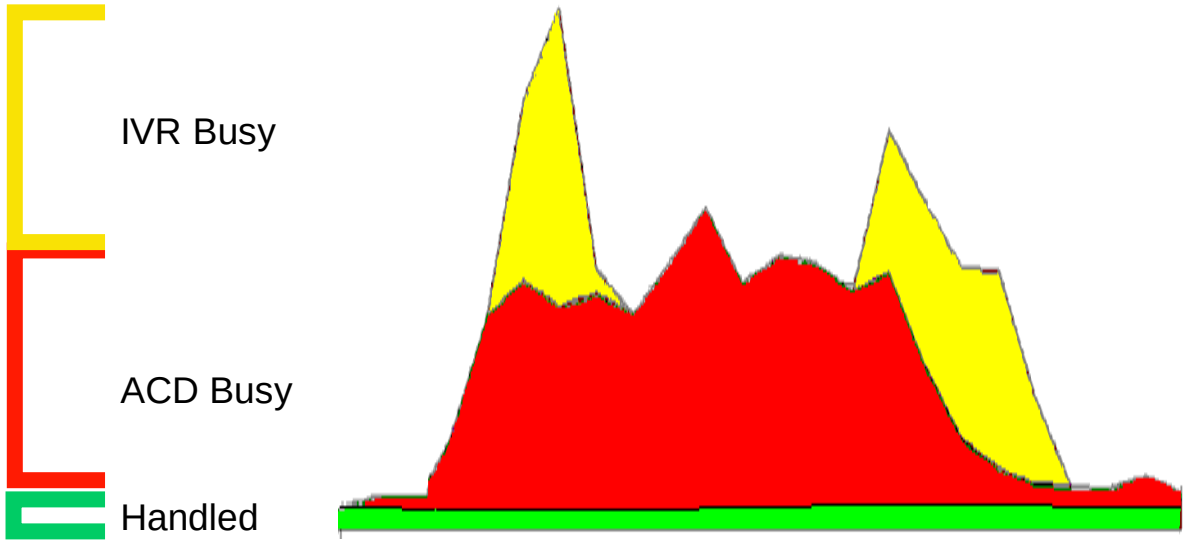
Example 2: February, 2003



Poll Question:

- How is the forecasting accuracy?
  A. Good
  B. Bad

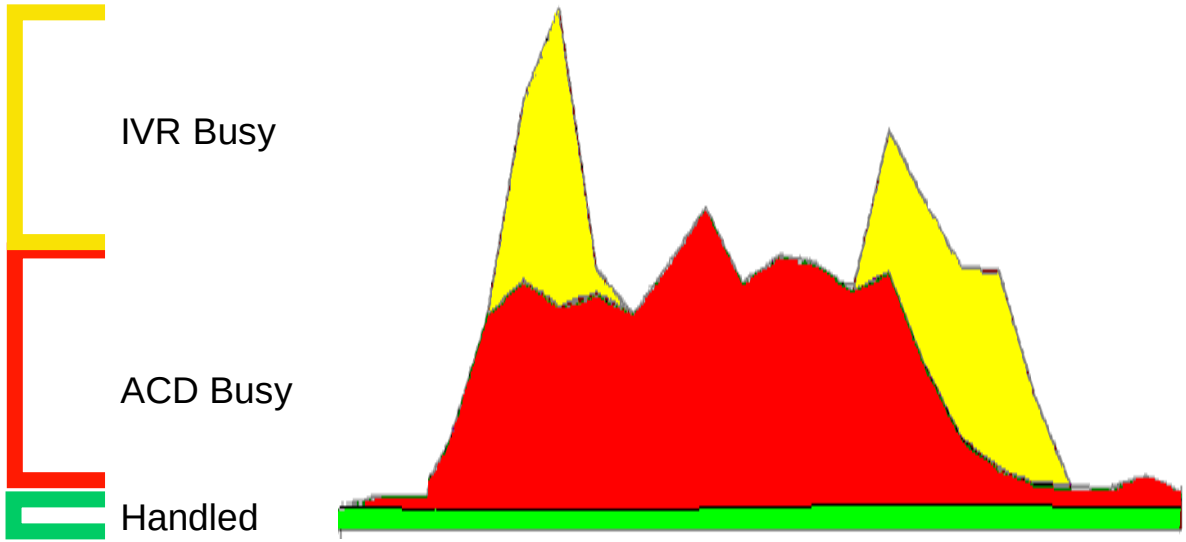
Example 2: February, 2003



Conclusions from data analysis (Commercial WFM Solution):

- 98% forecasting accuracy
- Service levels were now 100%
- Lay-off agents, shut down call centers and centralize!

Example 2: February, 2003



Conventional WFM View:

- 100% Service Levels
- 98% Forecasting Accuracy
- Capacity Based Forecasting does not work
- Erlang predicted this

Example 3: December 2003

An unnamed supervisor, December 2003:

- Talk Times don't matter
- Adherence does not matter
- Metrics don't matter
- Agents need to finish servicing each customer
- Improvement starts with the right number of agents

Poll Question:

A. Agree
B. Disagree
C. Strongly disagree
D. The supervisor should be fired

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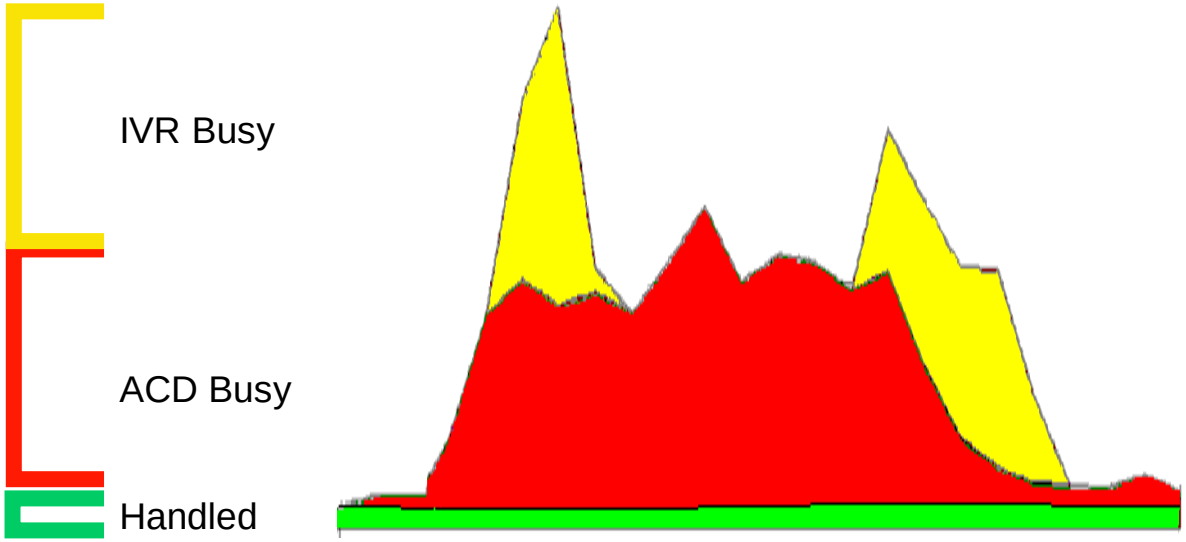
Unconventional Wisdom

An unnamed supervisor, December 2003:

- Talk Times don't matter
- Adherence does not matter
- Metrics don't matter
- Agents need to finish servicing each customer
- Improvement starts with the right number of agents



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Lost Wisdom

Agner Erlang

(1909, Theory of Probability and Telephone Conversations)

- This method should discarded and replaced
- Interval Based forecasting is distorted (x10)
- Transaction Details would work better (“inter arrival times”)

Do Simulations Improve on Erlang ?

Simulations

- Also an interval based planning method
- Uses random numbers to generate loss
- Simulated Talk Times & Call Counts (Loss)
- Simulated Busy Signals (Loss)
- Simulated Abandons - aka impatience (Loss)
- Simulated Bottlenecks (Loss)

Conclusions

- Agent requirements average lower than Erlang
- Advocates boast of 4% lower labor forecasts vs. Erlang
- Might as well multiply by 0.96
- Not helpful for understaffing or growth
- All of the interval based planning distortions apply

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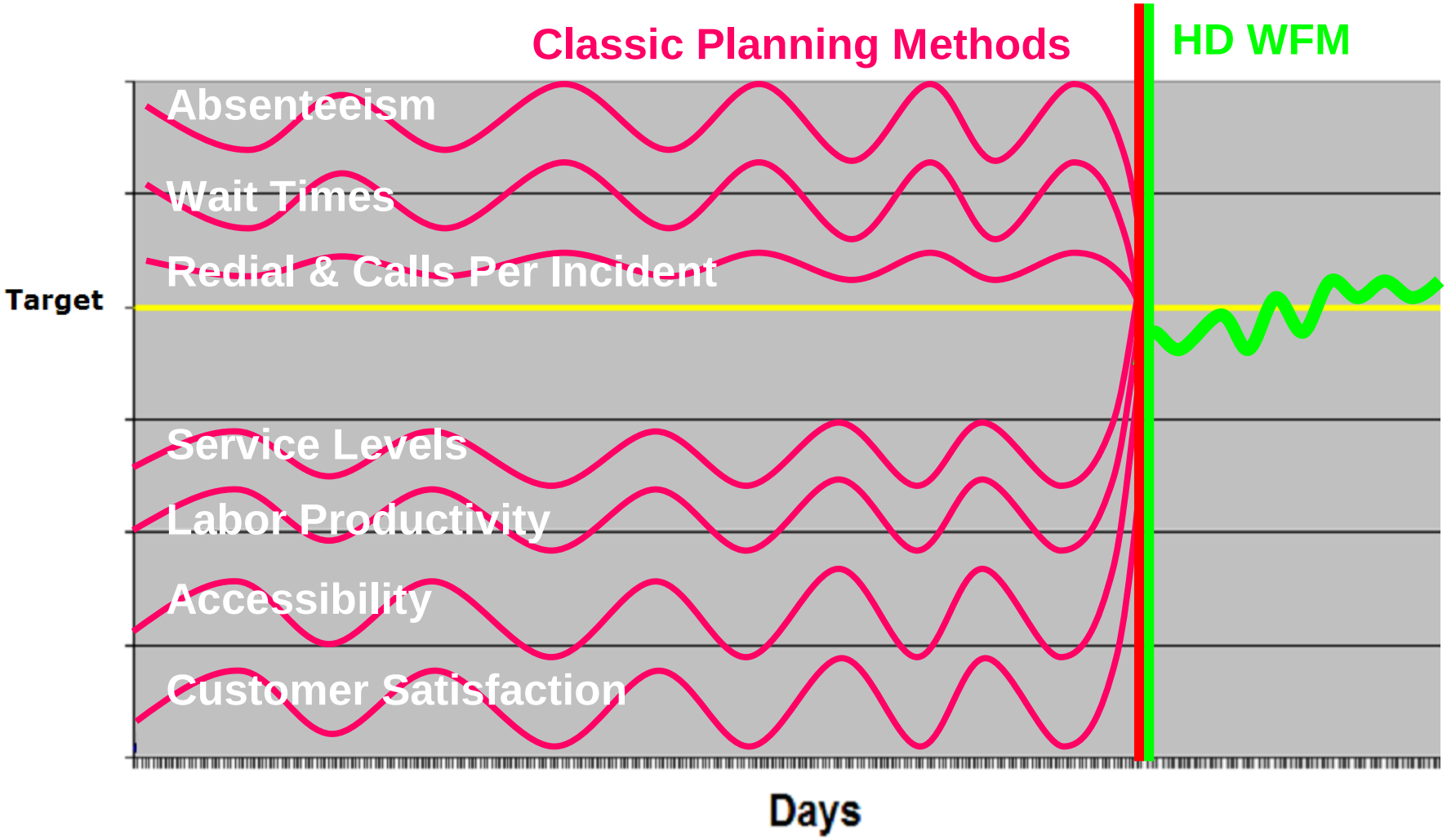
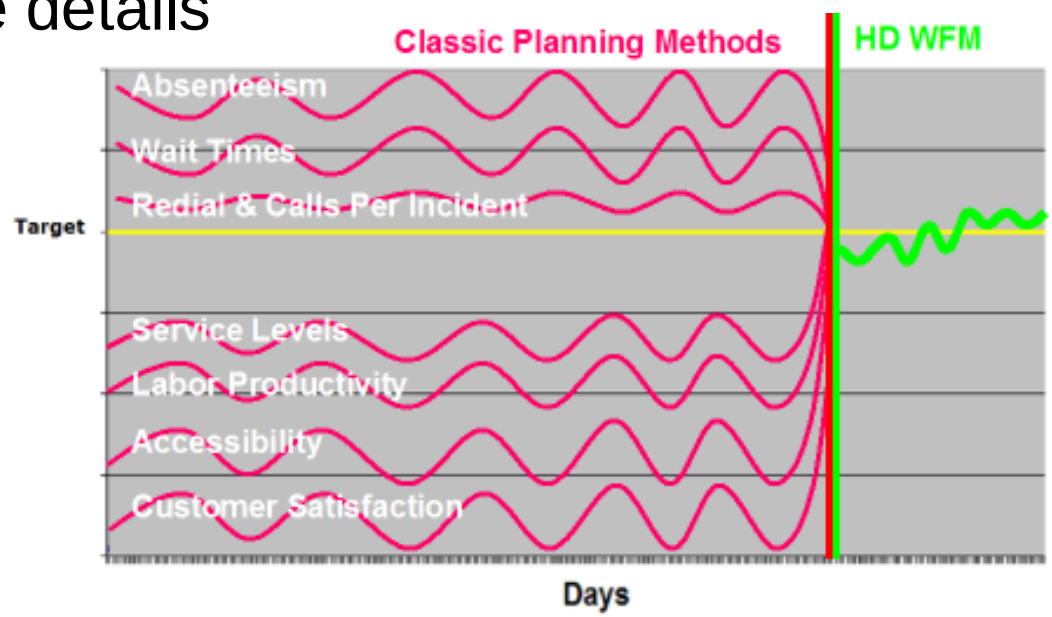
HD WFM Vision



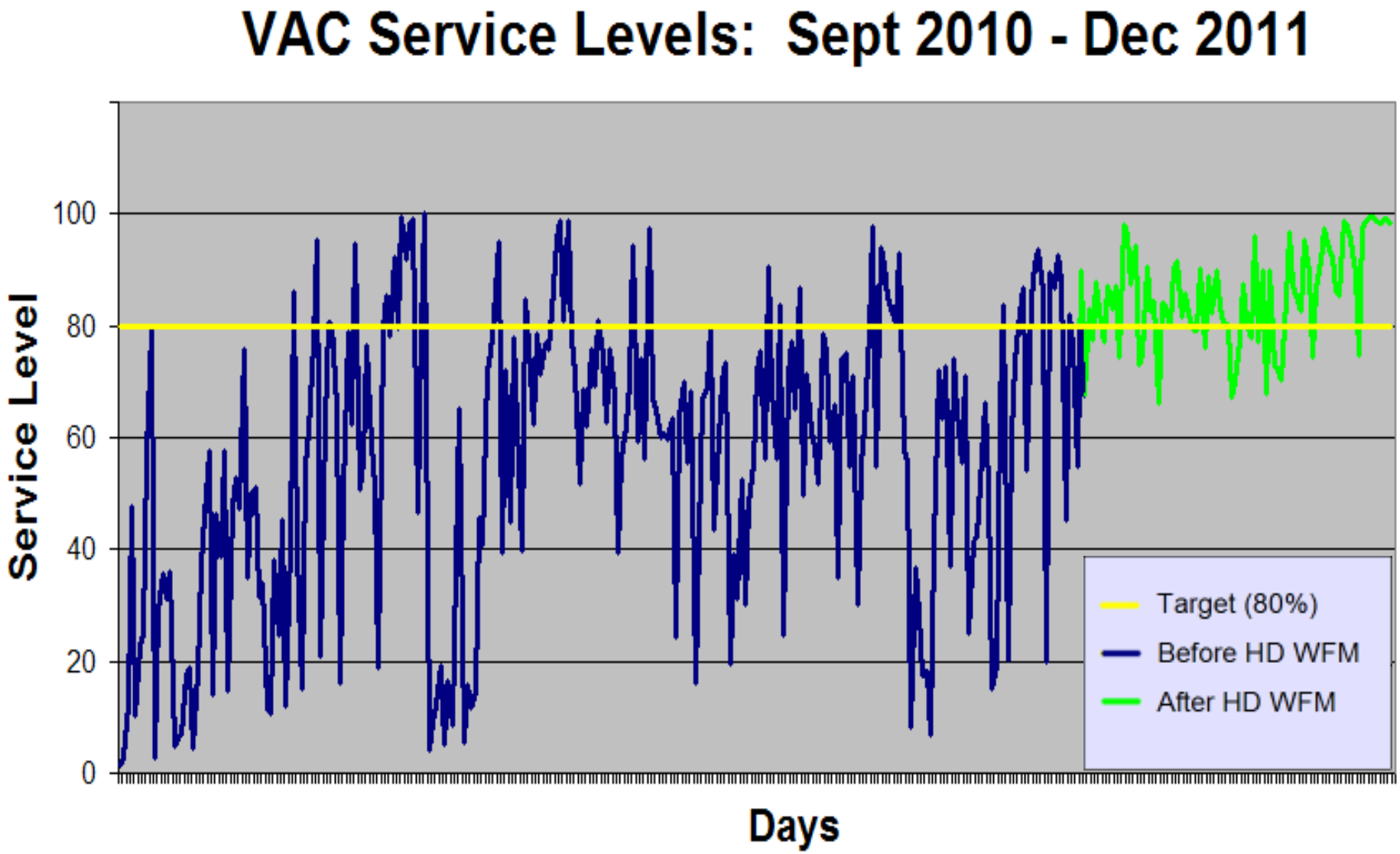
HD WFM Vision

2005 Vision Assumptions:

- No solution that relies on Erlang can help
- Interval based planning does not work
- Interval based metrics are unreliable
- No value in asking agents to adhere to bad schedules
- The list of problems is probably much longer
- The solution is in the details



HD WFM Reality – 2008 to 2012 examples



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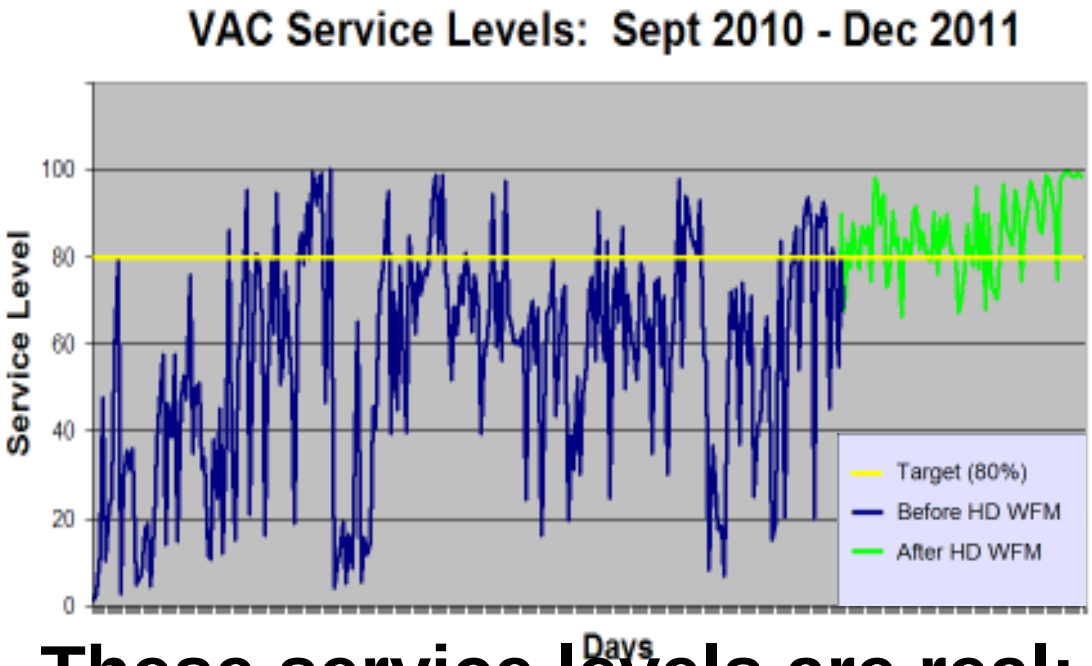
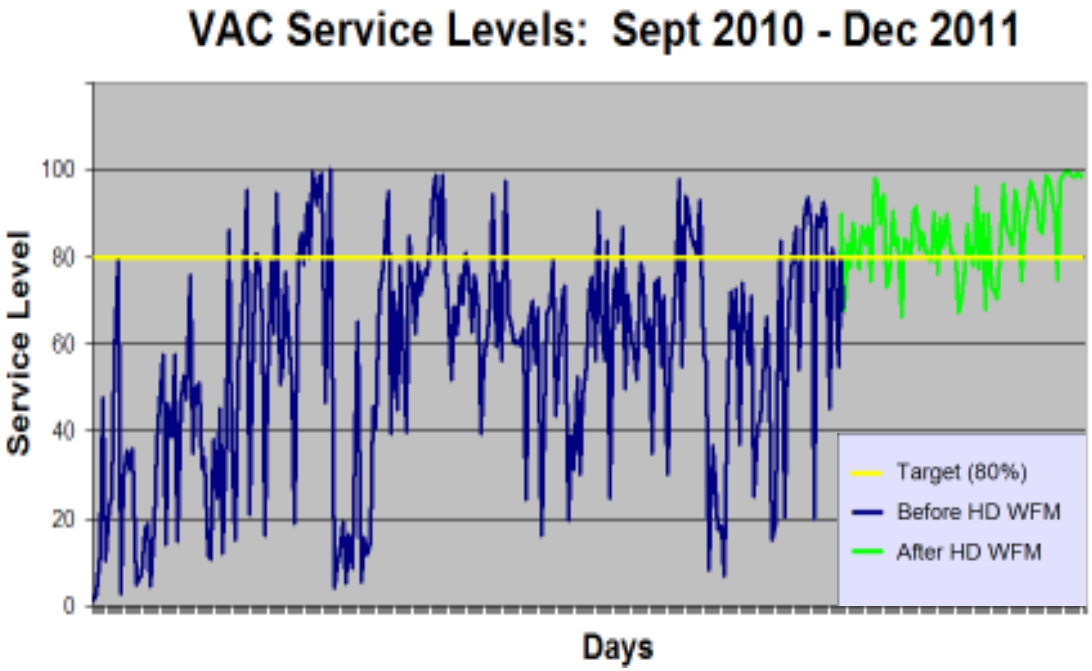
HD WFM Reality



These service levels are real:

- No busy signals
- All callers reach the queue
- No one abandons
- No discouraging IVR messages
- Patient callers, essential service, single provider

HD WFM Reality



These improvements are real:

- No changes to infrastructure or call flow
- No additional agents
- Start of a busier season on one of the busiest days
- Only change was HD WFM Forecasts & Schedules

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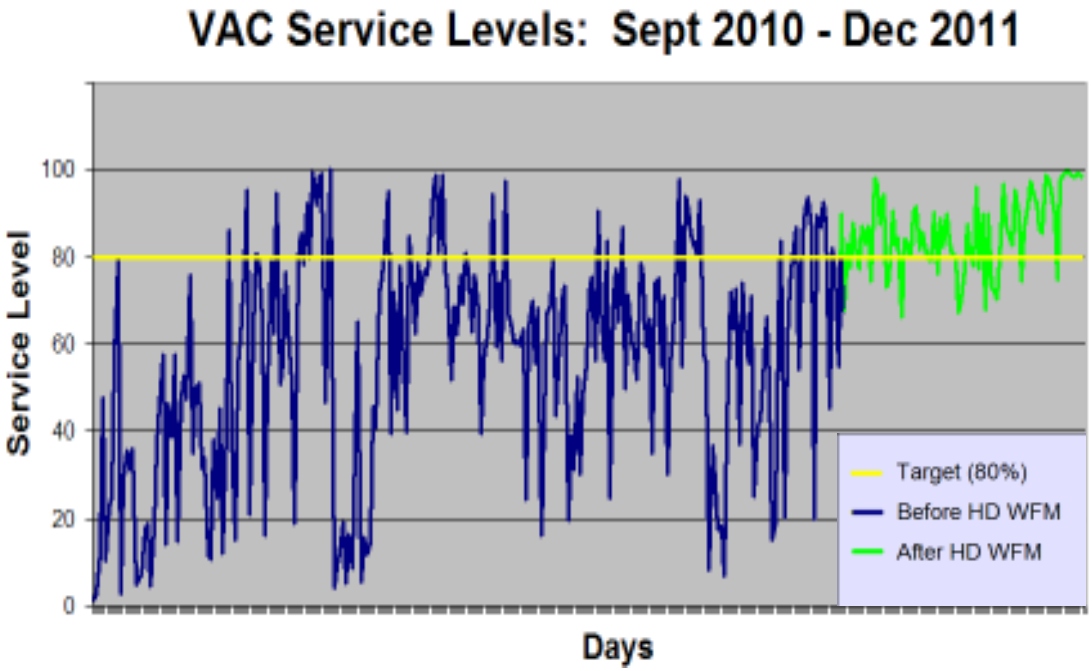
HD WFM Reality



Before & After:

- Five years of distress & decline
- A single moment of change entirely driven by the cut-over
- Permanent sustainable improvement
- Progressive improvements from the moment of cut-over

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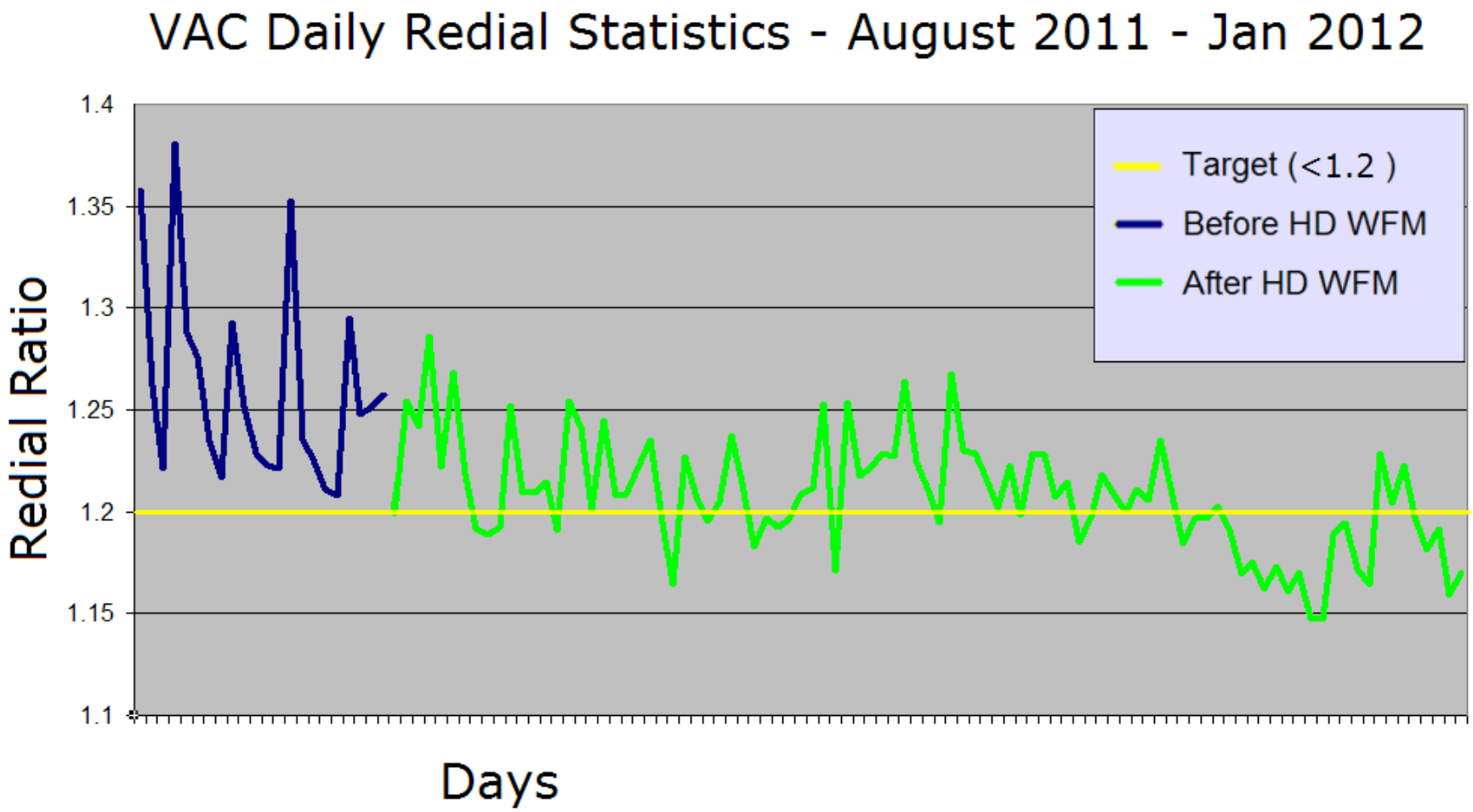
HD WFM Reality



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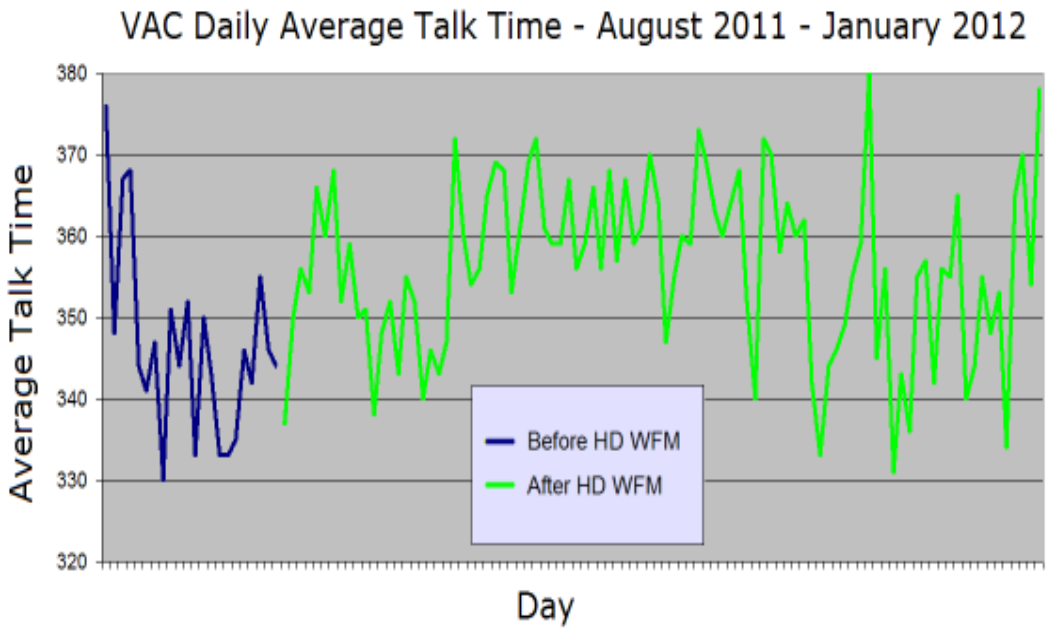
HD WFM Reality

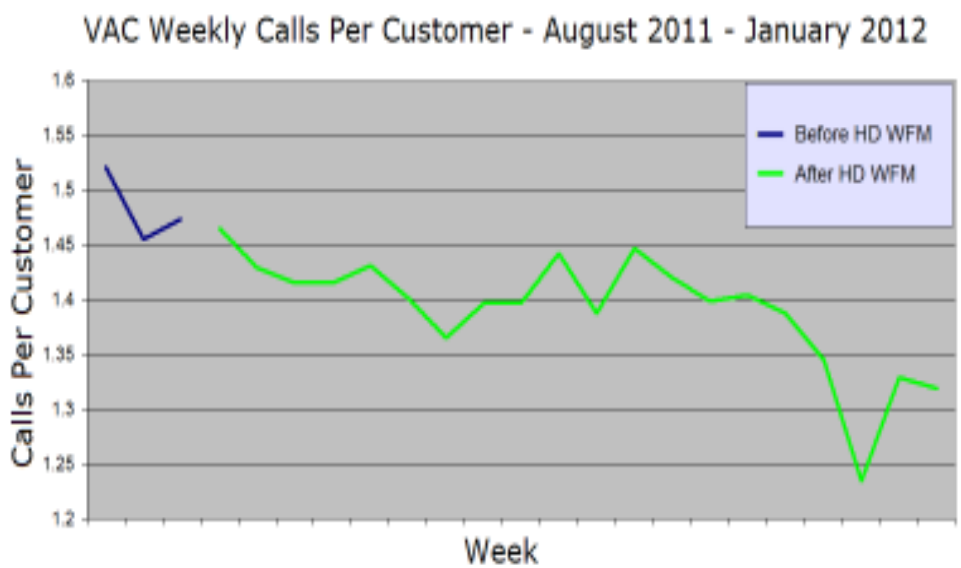
Productivity:

- Talk Time does not measure productivity
- Variance is good
- It means agents care



Satisfaction rate:

- Fewer calls per customer
- Legitimate productivity
- Higher percentage of call is spent solving problems



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Why Classic Forecasting Fails

The 2 smallest of the 10 Distortions:

- Wait Times don't matter
- 300 + 300 = 300

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What happens when wait times don't matter

Long Wait Time Example: Monday 9:00 AM – 9:30 AM

Historical Statistics				Target
Averge Wait Time	Service Level	# Calls	Average Duration	Service Level
40 Minutes	10% 120s	300	10 Minutes	90% in 120 s

Calculations: 300 calls x 10 minutes /30 minutes = 100 Erlangs
fx(100, 90% in 120s) = 110 Agents

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Optimal Wait Time Example: Monday 9:00 AM – 9:30 AM

Historical Statistics				Target
Averge Wait Time	Service Level	# Calls	Average Duration	Service Level
1 Minute	80% 120s	300	10 Minutes	90% in 120 s

Calculations: 300 calls x 10 minutes /30 minutes = 100 Erlangs
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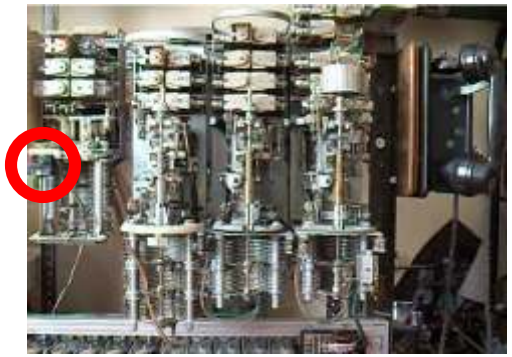
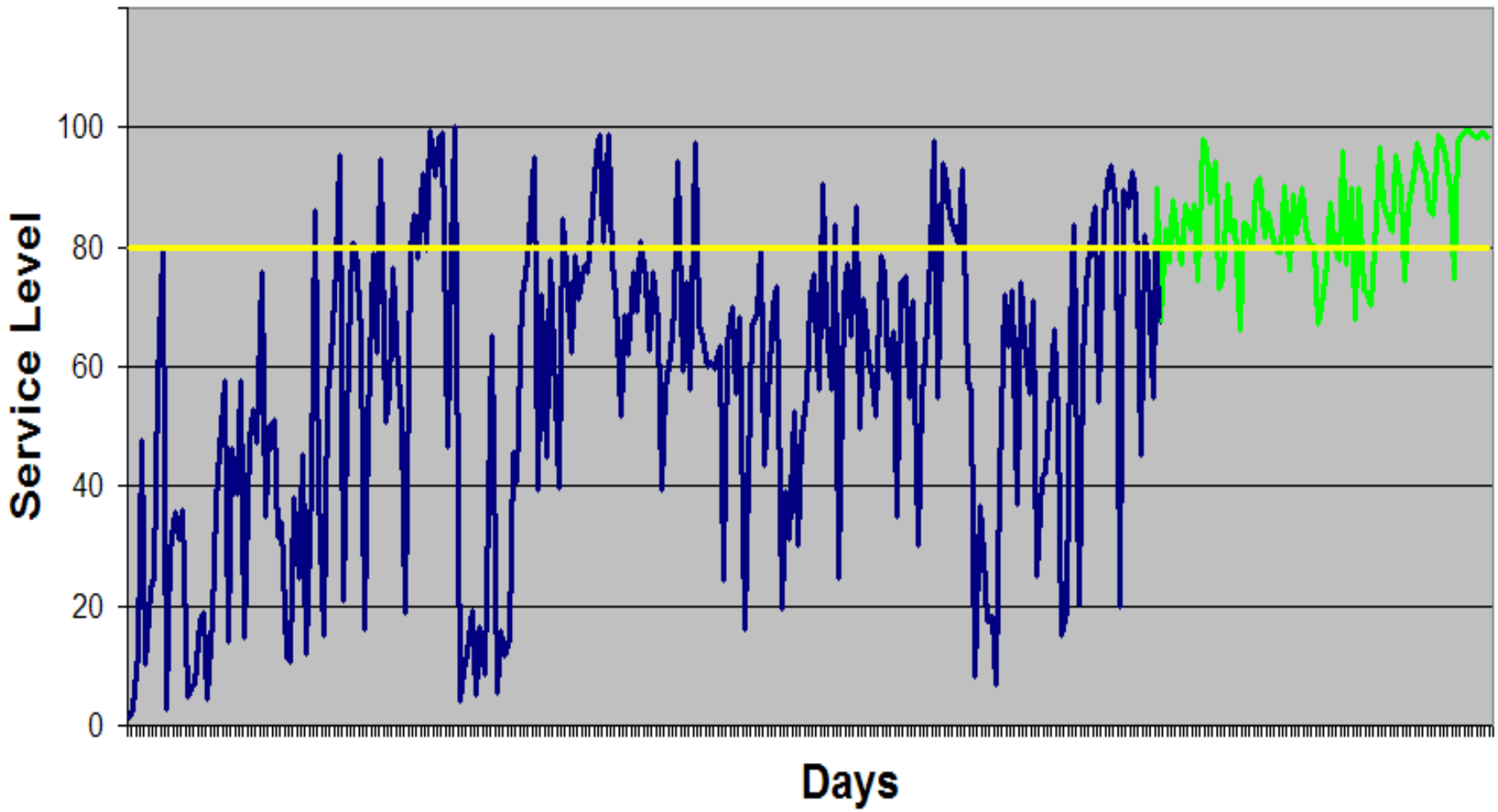
Why wait times don't matter



- Odometers can't collect wait times or SL
- There is no place to input wait times into the forecast
- Forecasting on the assumption customers never waited
- Do you want to trust your call center to a technology that does not care how long your customers wait.

When does 300 + 300 = 300?



300+300 = 300

- 9:00 AM – 9:15 AM
- 600 Callers are Routed to the Queue
- 300 Calls are Answered
- 0 Callers Abandoned
- Offered Calls = Answered + Abandoned = 300
- 300 + 300 = 300
- These are “call pegging errors”
- Another reason Interval Statistics don’t work

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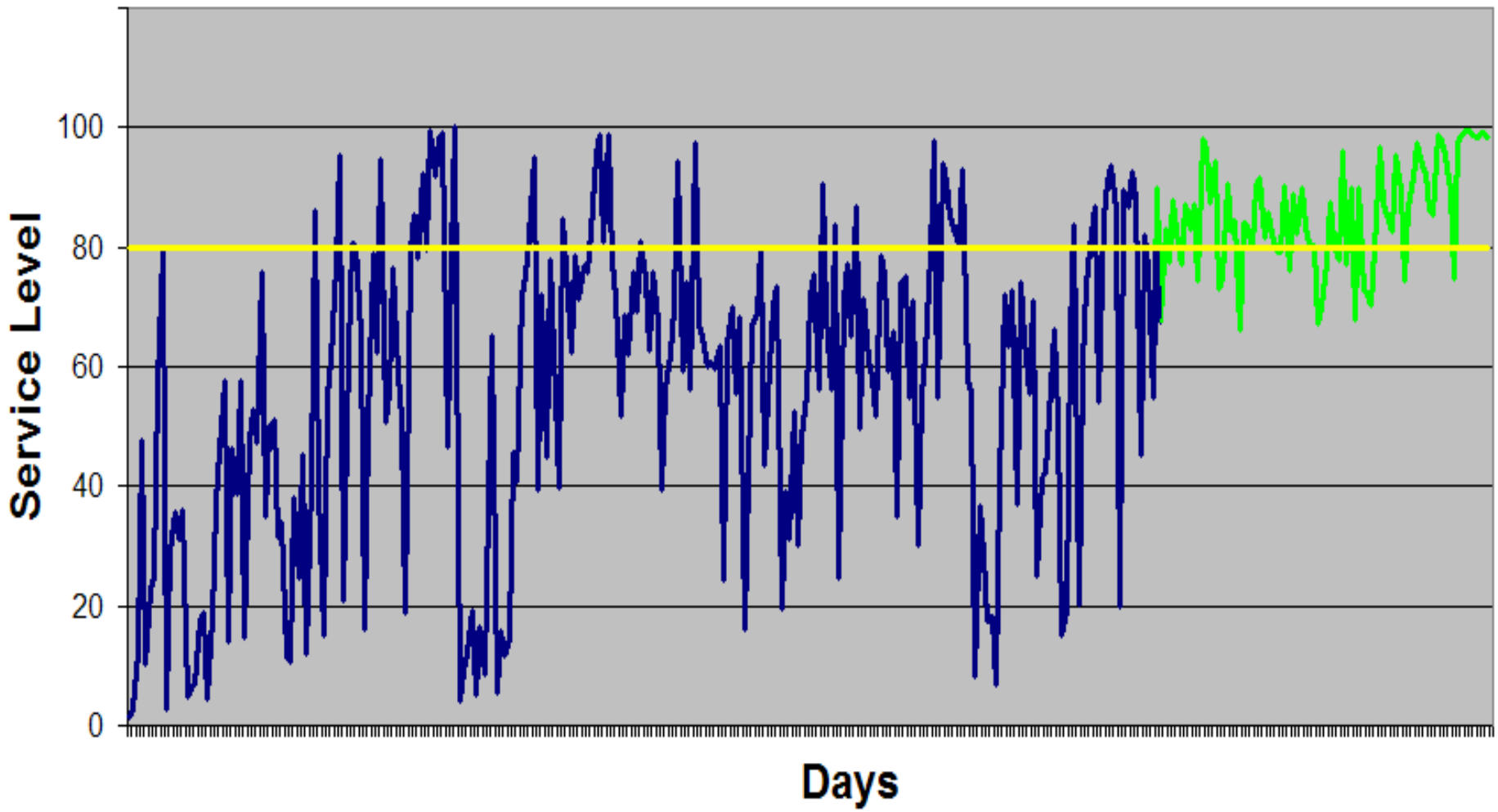
Interval Statistics Don't Work



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HD WFM is Modern

- Network Aware for Global Resource Coordination
- Intricate knowledge of exact demand from each customer
- Precision treatment of IVR deflections & redial
- Understands carry-over effects, detailed skew and long calls
- Multi-Skill, Multi-Site Enterprise Forecasting
- Cares how long customers have waited
- Cares about Risk and Revenue

"It is all about preparedness. HD WFM prepares a call center to stay ahead of the curve including risk. Classic forecasting & WFM sets-up the call center to be behind the curve for average activity -- even worse off for what really happens. Conventional thought is that call centers need to react real time. If a call center is properly prepared, the real time variations are absorbed into the plan. Needing to react in real time is a tell-tale sign of legacy planning distortions."

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Why Schedule Optimization Fails

Random Trials Scheduling:

- Random starts, ends and breaks
- Stressful for agents
- High absenteeism
- Excessive part time shifts
- No re-optimization, only entire schedules
- ACD Based Optimization
- Provides no coordination across sites

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Modern Uniform Scheduling

- Based on Logic, Not Random numbers
- Consistent Schedules for agents
- Fair rotations
- Blend of Fixed & Variable Shifts
- Consistent Schedules for Variable Agents

- Worst way to fix a call center is to add stress to agents

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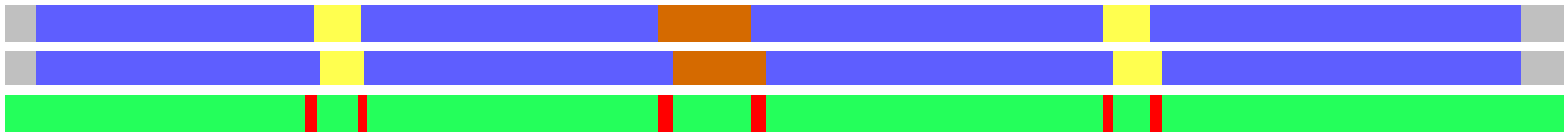
Why Adherence Makes Things Worse

Binary Adherence:



- The best most agents can do is 76%
- Agents are penalized when they finish a call properly
- Agents are penalized for proper break time
- Agents don't like it and don't believe in it
- Can't differentiate diligence from freeloading
- Adherence threshold fosters freeloading
- Low Scores foster fraud, mute-ups and surfing
- Adhering to a forecast? Really?
- Shouldn't we be adapting to today?

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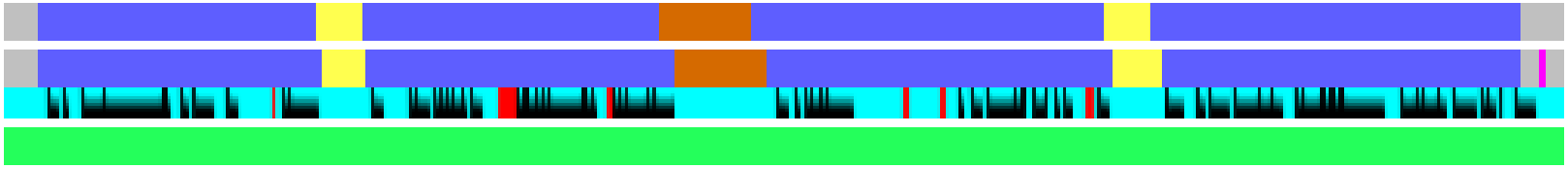
HD Intelligent Adherence



- Fair
- 100% Adherence is achievable to agents with spirit
- Agents are not penalized arbitrarily
- Agents see own adherence
- Agents like it and believe in it
- Clutter free for supervisors
- Crisp “Tactical Adherence”
- Improved operational Granularity

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WFM Best Practices

Important Call Center Best Practices:

- Forecast (using interval based method).
- Schedule to Forecast
- Reforecast Frequently
- Reduce Talk Times → Higher Productivity

Important Call Center metrics:

- Forecast Accuracy
- Service Levels
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Poll Question:

- How many of the above items do you agree with?
  A. All B. Most C. Some D. None

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What Makes Shift Trading Too Hard

- Calendar Navigation
- One trade at a time
- Face-to-Face brokering

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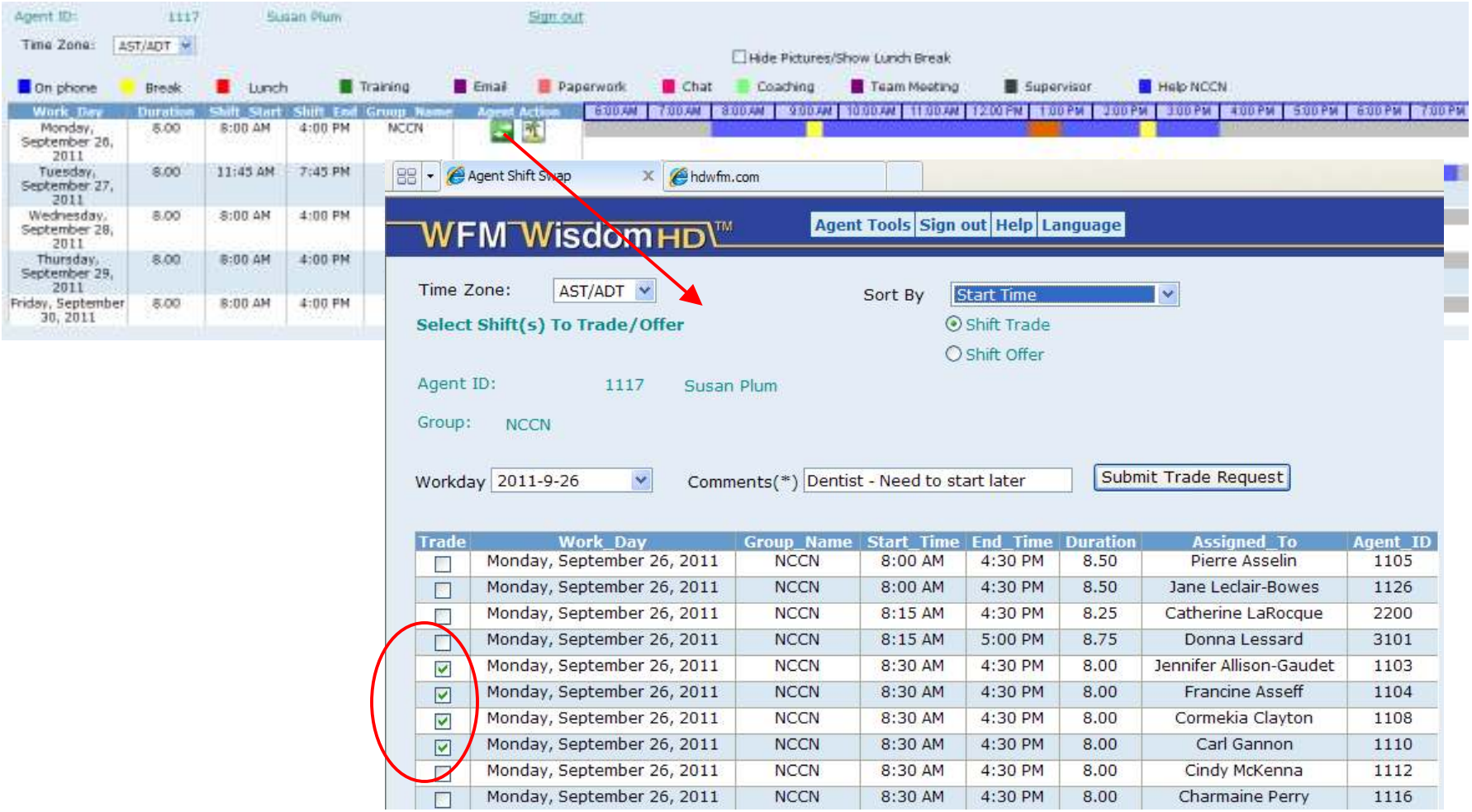
What Makes Shift Trading – Easy (Agent)

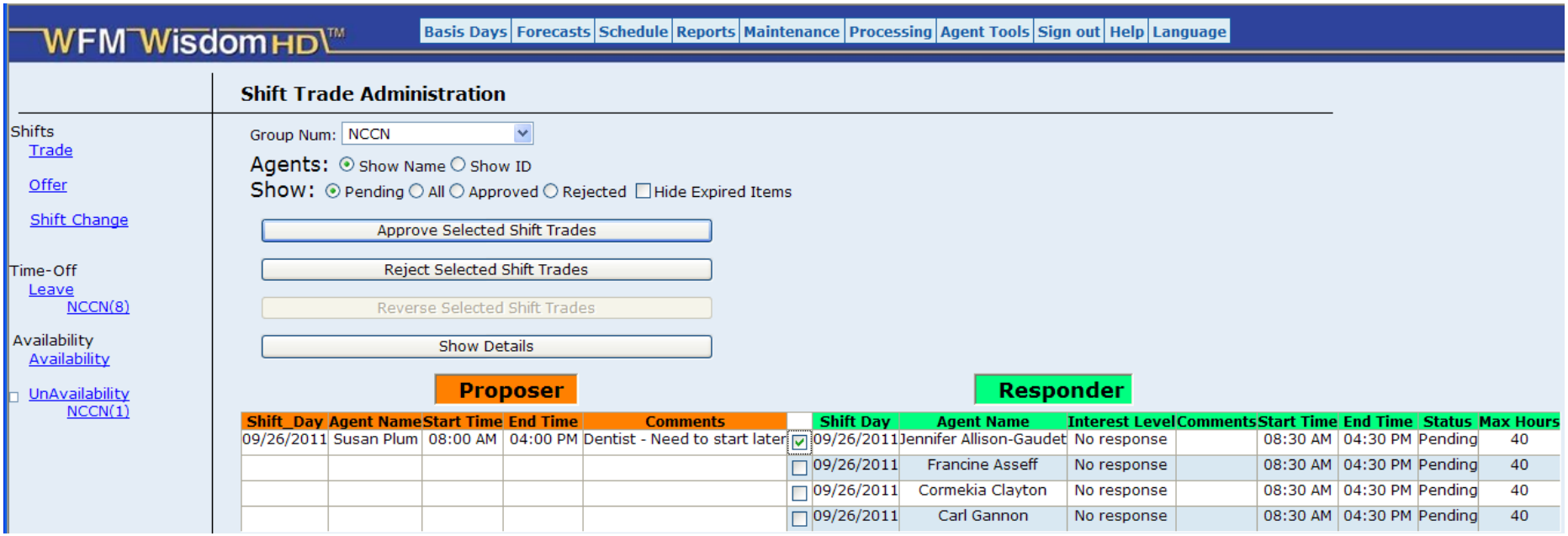
- Trade Shift



Trade	Work_Day	Group_Name	Start_Time	End_Time	Duration	Assigned_To	Agent_ID
☐	Monday, September 26, 2011	NCCN	8:00 AM	4:30 PM	8.50	Pierre Asselin	1105
☐	Monday, September 26, 2011	NCCN	8:00 AM	4:30 PM	8.50	Jane Leclair-Bowes	1126
☐	Monday, September 26, 2011	NCCN	8:15 AM	4:30 PM	8.25	Catherine LaRocque	2200
☐	Monday, September 26, 2011	NCCN	8:15 AM	5:00 PM	8.75	Donna Lessard	3101
☑	Monday, September 26, 2011	NCCN	8:30 AM	4:30 PM	8.00	Jennifer Allison-Gaudet	1103
☑	Monday, September 26, 2011	NCCN	8:30 AM	4:30 PM	8.00	Francine Asseff	1104
☑	Monday, September 26, 2011	NCCN	8:30 AM	4:30 PM	8.00	Cormekia Clayton	1108
☑	Monday, September 26, 2011	NCCN	8:30 AM	4:30 PM	8.00	Carl Gannon	1110
☐	Monday, September 26, 2011	NCCN	8:30 AM	4:30 PM	8.00	Cindy McKenna	1112
☐	Monday, September 26, 2011	NCCN	8:30 AM	4:30 PM	8.00	Charmaine Perry	1116

Easy Shift Trading - Supervisors

- Single Click Approval
- Automatic Clean-up
- Skills Impact Filter
- Highly Configurable



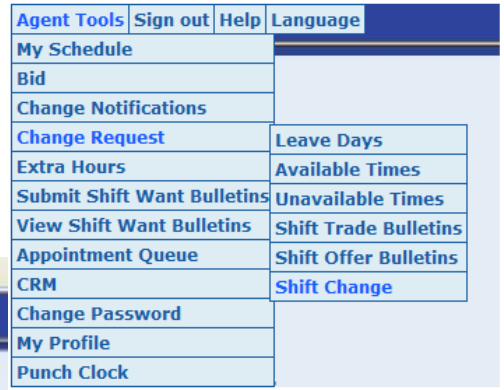
Ease of Use - Agents

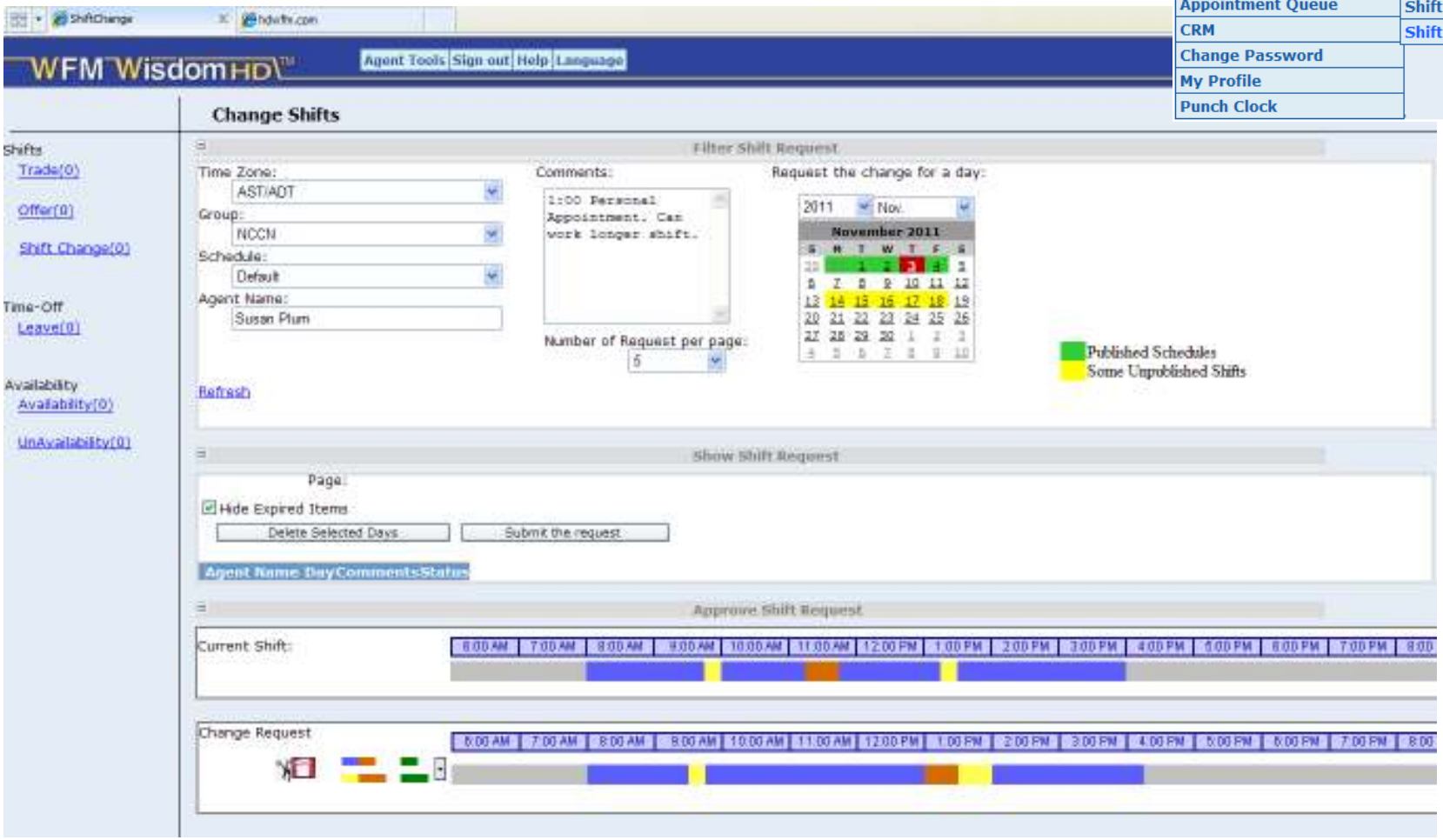
- My Schedule

Agent Tools	Sign out	Help
My Schedule		
Bid		
Change Notifications		
Change Request		
Extra Hours		
Submit Shift Want Bulletins		
View Shift Want Bulletins		
Appointment Queue		
CRM		
Change Password		
My Profile		
Punch Clock		

Ease of Use - Agents

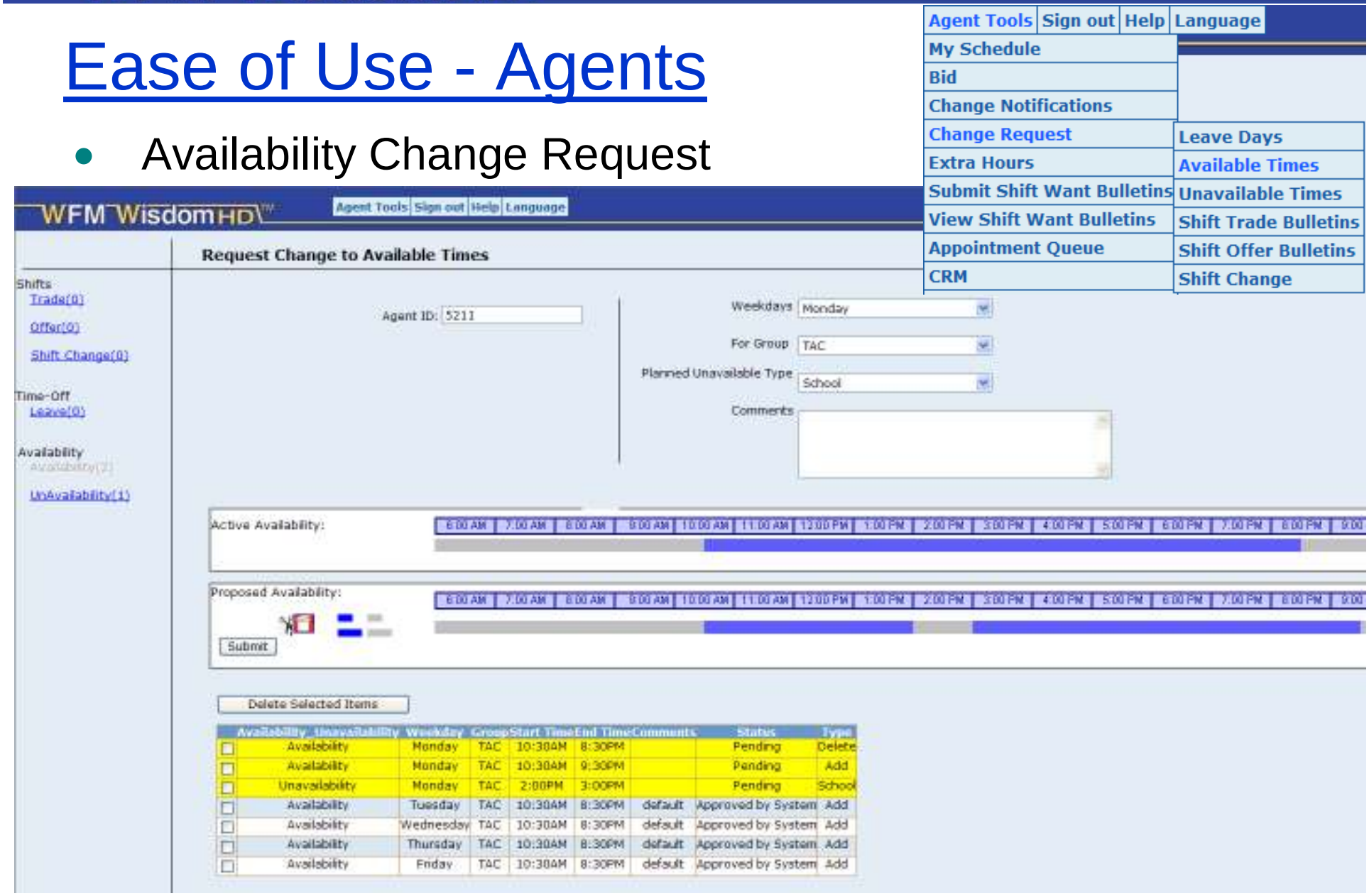
- Shift Change Request





Ease of Use - Agents

- Availability Change Request



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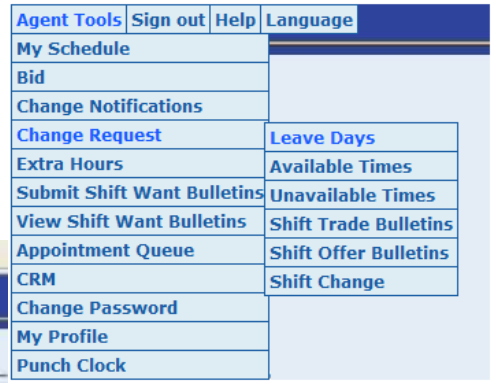
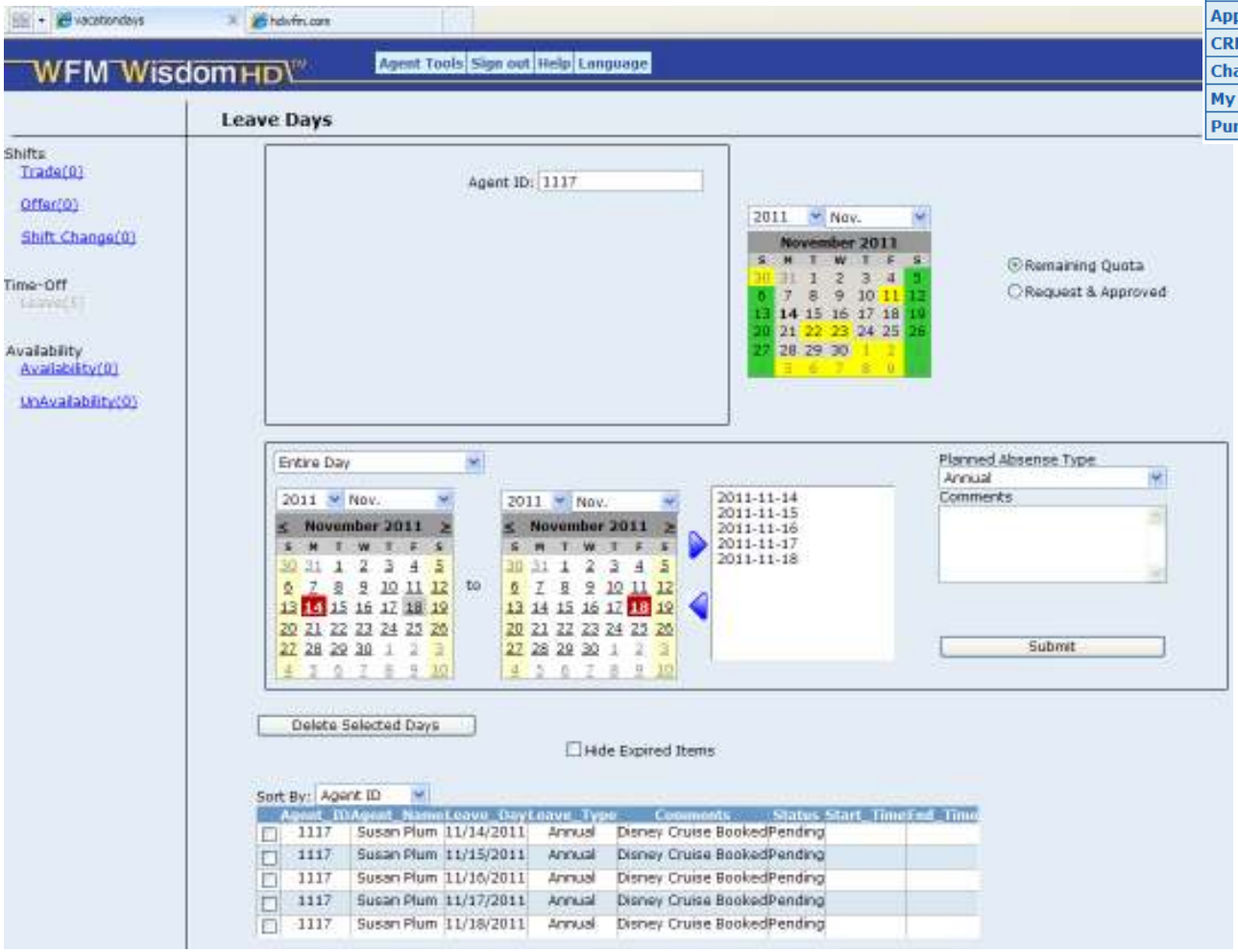
Ease of Use - Agents

- Vacation Requests & Vacation Bidding



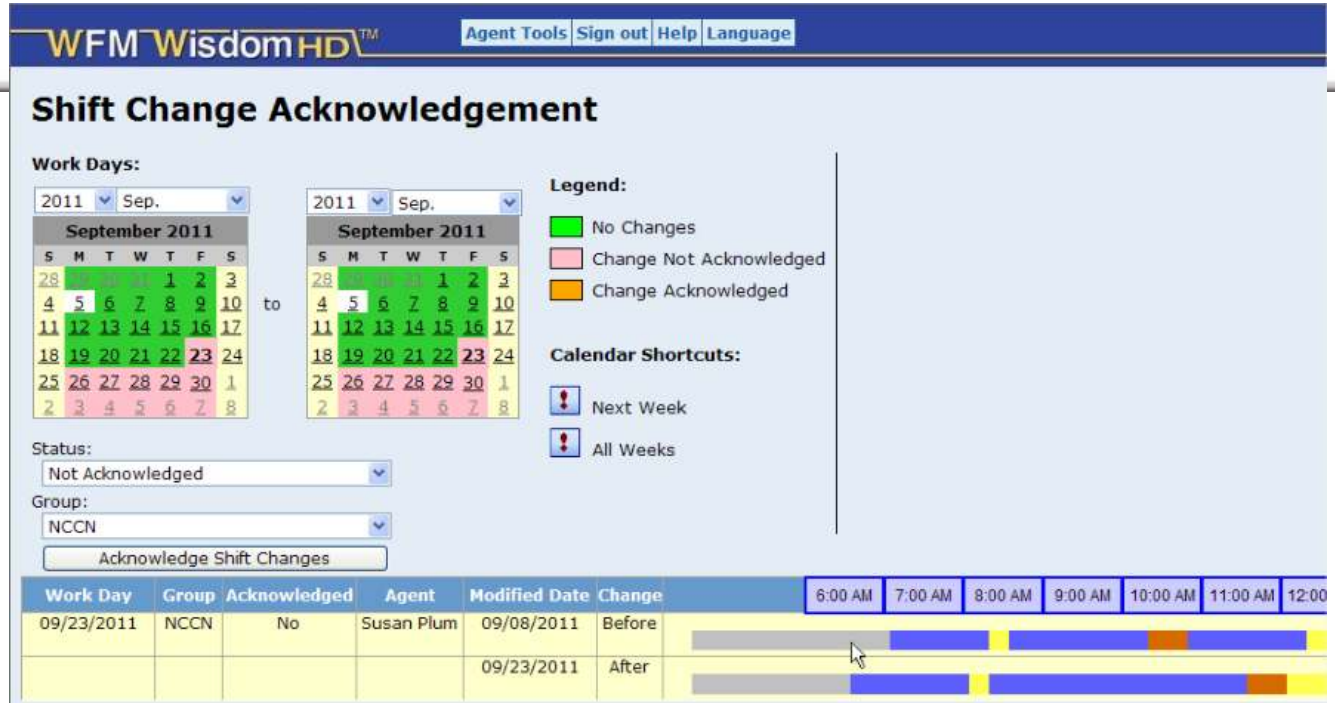


Ease of Use - Agents

- Schedule Change Notifications

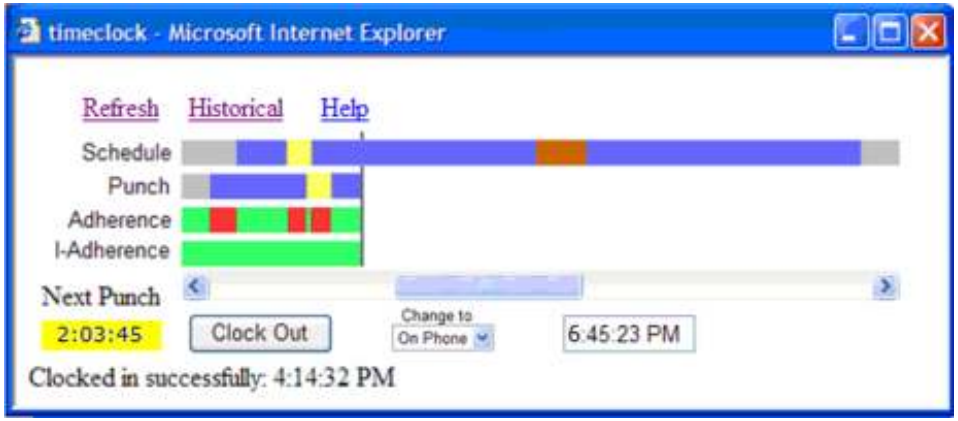
Subject: Email Notification for a schedule change

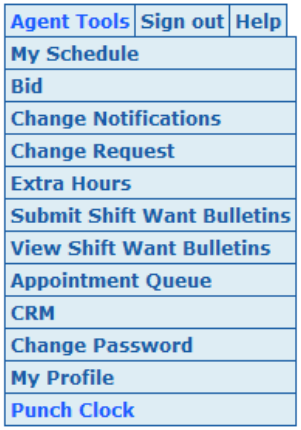
Your schedule has been changed for for Wednesday, September 21, 2011 Please acknowledge your schedule by going to the following link:
http://www.wfmwisdom.com/vachdwfm/shiftChangeAck.aspx?Agent ID=3141&Forecast Day=2011-09-21T00:00:00



Ease of Use - Agents

- Punch Clock





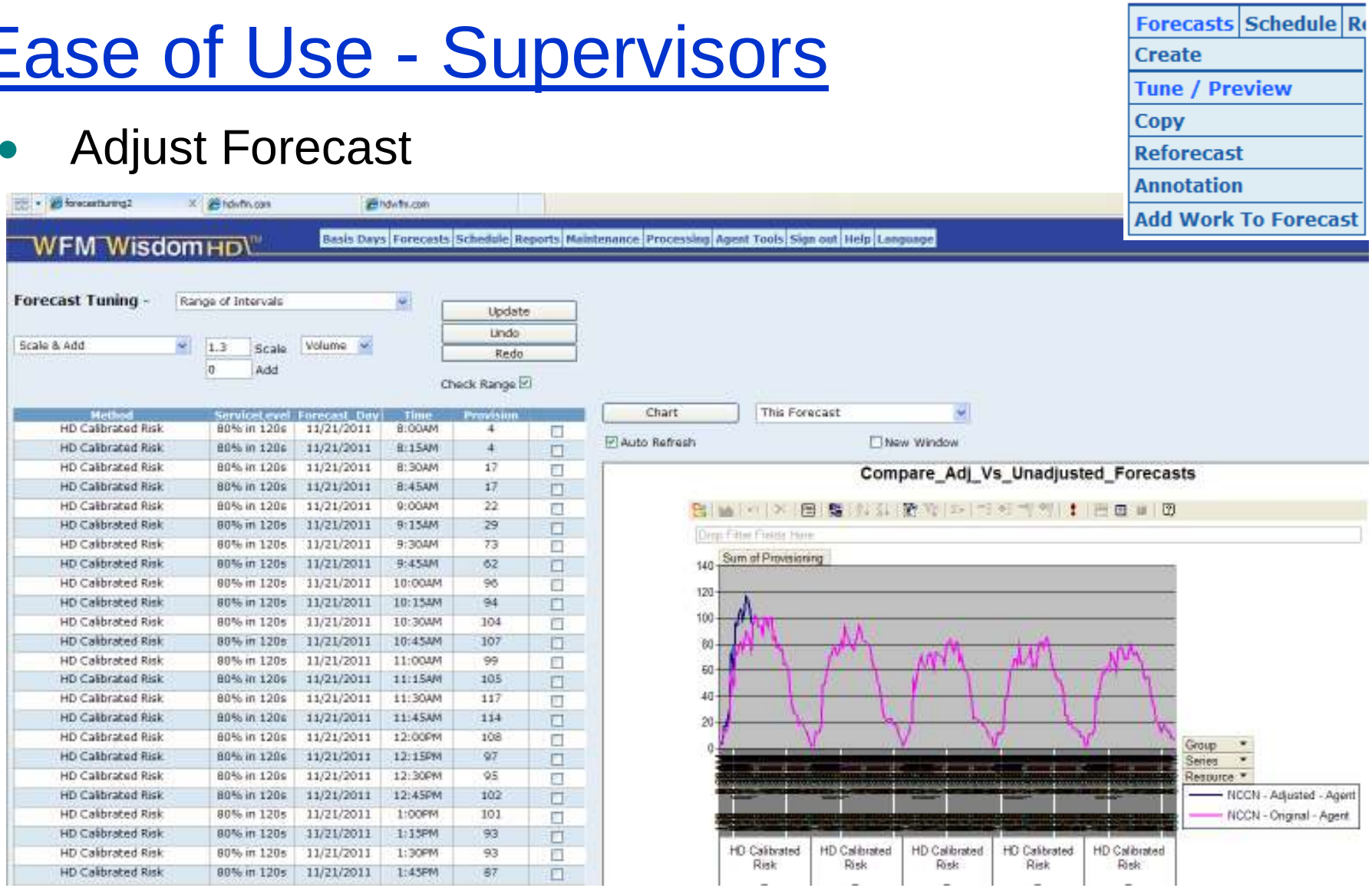
Ease of Use - Supervisors

- Create Forecast

Basis Days	Forecasts	Schedule	Re
	Create		
	Tune / Preview		
	Copy		
	Reforecast		
	Annotation		
	Add Work To Forecast		

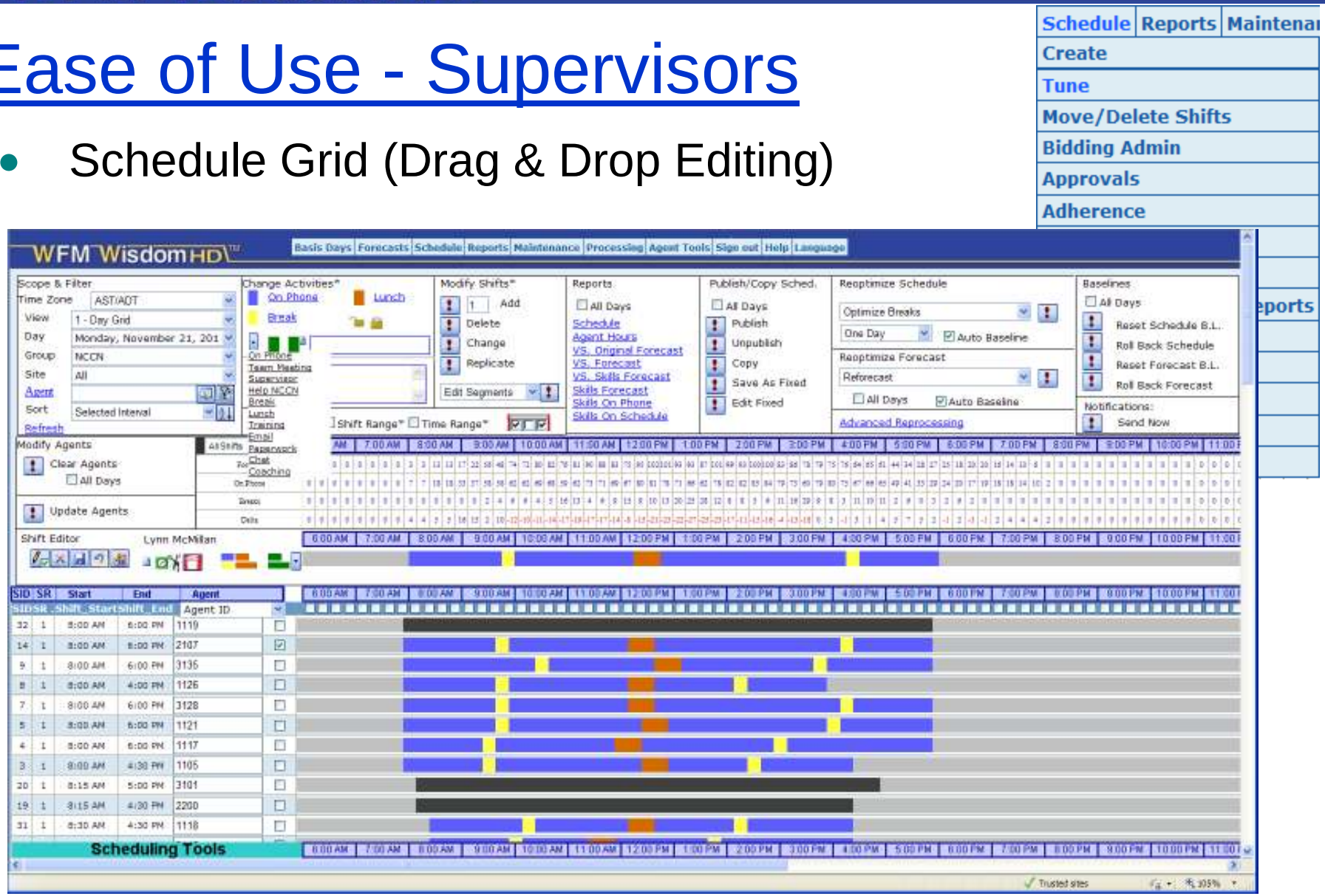
Ease of Use - Supervisors

- Adjust Forecast

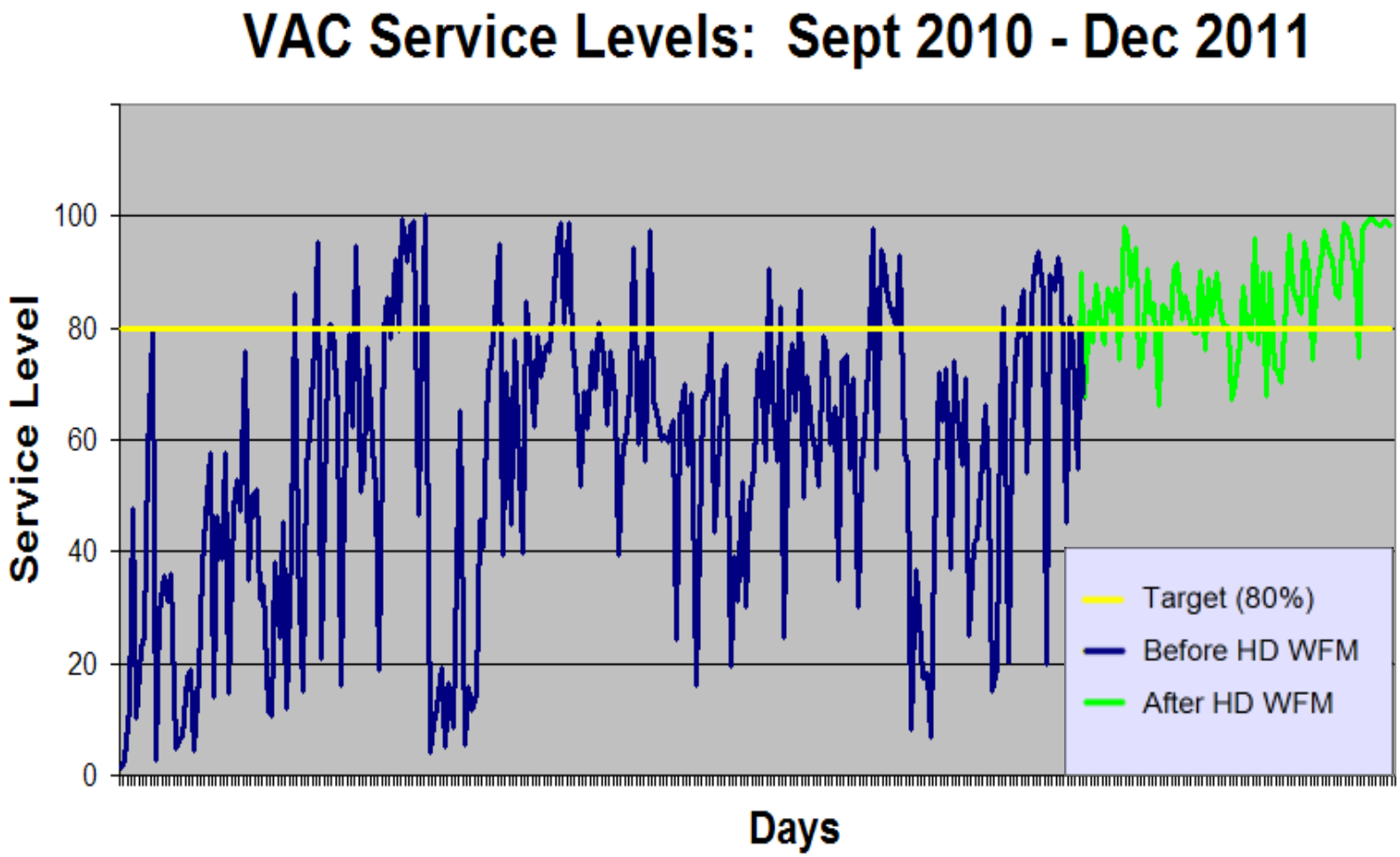


Ease of Use - Supervisors

- Schedule Grid (Drag & Drop Editing)



Questions


VAC Service Levels: Sept 2010 - Dec 2011
Service Level
100
80
60
40
20
0
Days
Target (80%)
Before HD WFM
After HD WFM