Concrete Infocus

January/February 2009

A PUBLICATION OF THE NATIONAL READY MIXED CONCRETE ASSOCIATION

10th Annual Fleet Benchmarking & Cost Survey Report

Advancing Higher Volume Fly Ash Concrete with Acceptable Performance

Weathering the Economic Storm

Warrior Management: Building Your Business Empire

Disaster Resistant Construction
A contractor needed to place nine miles of four-lane paving through the mountains of North Carolina. The project was on a fast-lane schedule and fighting difficult weather conditions every step of the way. The contractor called CEMEX, even though the closest plant was two hours away. He insisted on working with the people of CEMEX because he had done it before and we had never let him down. We still haven’t. 24,000 tons of cement were hauled to the job site and soon drivers were speeding along Interstate 26 from North Carolina into Tennessee.

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Photo by Michael Boyle
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contents

features

10 Concrete Doesn’t Just Come in Vanilla Anymore Part 8: Disaster Resistant Construction

13 Highlights of the 2008 NRMCA Industry Data Survey

22 Warrior Management: Building Your Business Empire

28 Advancing Higher Volume Fly Ash Concrete with Acceptable Performances

37 Well-Trained Employees Help Companies Weather Economic Storm

departments

6 Truck Tracs: 2008 Fleet Benchmarking and Cost Survey Report

9 Capitol Comment: A New Year, A New Congress Bring Optimism for Industry Advocacy

16 Education Matters: It’s Not Always the What But Often the How

19 Producer Profile: Texas Producer Uses Innovative Approach for Employee Safety Training

25 Environmental Scene: Concrete Producer, or Hazardous Waste Generator?

30 Safety First: Oxygen-Fuel Gas Welding and Cutting Safety

32 Tech Talk: Changes to Concrete Mixtures and Submittals During a Project

39 Corporate Suite: Leading Your Workforce During an Economic Crisis

41 Best Sellers from the NRMCA Bookstore

45 Workforce Issues Q & A

49 Advertiser.com

50 Index to Advertisers

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2008 (10th Annual) Fleet Benchmarking and Cost Survey Report

By Greg Vickers, Managing Director of Operations

This year marks the tenth year that NRMCA has gathered fleet maintenance operational practices and cost data on behalf of the ready mixed concrete industry. Each year the Operations Task Group of the Operations, Environmental and Safety (OES) Committee reviews and updates the survey. Many past and current members of the OES Committee deserve commendation for the development and refinement of this valuable industry benchmarking tool since 1998 when the survey was first conceived.

Recently, NRMCA offered the inaugural Fleet Manager Certification Course. Data from the annual Fleet Benchmarking and Cost Survey is a key element of the Financial Management section of the new course. Course attendees are introduced to industry-specific benchmarking as a comparative evaluation tool for the purpose of improving one or more aspects of their fleet’s performance. Essentially, the class is asked: “if you don’t measure your performance, how can you know how well you’re doing?”

A goal of the new Fleet Manager Certification Course is to get more industry fleet professionals involved in collecting and formatting this valuable information in a standard fashion. NRMCA acknowledges that the usefulness of these fleet performance statistics is enhanced by: a) the level of industry participation in the survey, and b) the consistency and accuracy of the reported information.

Some items in the survey were not responded to by all participants. The percentages of actual responses for many of these items appear in this article’s tables. Furthermore, in analyzing the data, staff has either asked respondents for clarification or elected to strike reported data when erroneous values prevented accurate tabulation of averages. We continue to examine and refine the wording of the survey questions with a goal of making the annual reports as accurate and pertinent as possible.

Results of the survey are compiled on a national basis. Responses came from eight geographical regions which are mapped in upper left corner of the survey form. This report focuses on national averages, without regional analysis.

The ‘Executive Summary’ of the Fleet Benchmarking and Cost Survey that accompanies this article offers a quick view of the national totals and averages for all the surveyed information.

This report on the 2008 Fleet Benchmarking and Cost Survey, analyzing 2007 data, addresses the highlights of the latest industry fleet operational practices and cost data, with a special focus on a few key trends.

1. Survey Participation: 82 companies or divisions reported their 2007 data

1. These 82 participants represent 14,609 truck mixers
   • 19% front discharge (2,774 units)
   • 81% rear discharge (11,835 units)
   (Rear discharge units included 76 trailer mixers and 54 w/belt conveyors)

Chart 1: Number of Truck Mixers Represented in Survey, 1998-2007

Notes: A statistically high percentage of the country’s ready mixed concrete trucks continue to be represented in the Fleet Benchmarking and Cost Survey. NRMCA estimates 75,000 operational truck mixers in the United States, meaning roughly 20% of the industry’s national mixer fleet is represented.

2. Average Survey Participant’s Truck Mixer Fleet Size: 175 Units (Median = 108)

The average number of truck mixers per reporting company or division is 178, with a fleets ranging in size from 10 to 1,092 units. The 178-unit average represents negligible change from the previous year’s average of 173. The median number, which may be more typical of company fleet size, is 108. The median means that half of the companies who responded to the survey have fewer than 108 truck mixers and half have more than 108 units. This final report is undoubtedly somewhat skewed toward big concrete producers, because so many of our largest members participated.

3. Average Truck Mixers to Mechanic Ratio: This is better as it is more consistent

13.5 truck mixers to 1 mechanic

Notes: Depending on the variety and types of equipment a mechanic services within a given company, these values vary quite a bit. We ask participants to do their best to eliminate mechanics’ time spent servicing equipment other than truck mixers and front-end loaders involved with batch plant operations. In any case, the mean reported values for the mixerto-mechanic ratio have remained fairly steady through the years of conducting the survey. Newer fleets consistently have the expected higher mixer-to-mechanic ratio than fleets running older equipment.

4. Average Fleet Age: 6.1 years

Notes: The fleet age drop-off over the last two years - from 6.8 to 6.1 years average age - reflects heavier-than-normal truck mixer purchases in 2006. 2006 was a record year for truck mixer sales, due to high ready mixed concrete production coupled with the looming introduction of engines compliant with new 2007 emissions specifications. Many fleets did not buy new truck mixers in 2007, so it is possible we will see the average fleet age increase a bit in next year’s report. However, the large
The number of truck mixers being parked, sold or retired due to the current poor construction economy may soften this effect, as the oldest machines are typically the first to go.

5. Average Truck Mixer Mileage/Year: 17,755

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>17,755</td>
<td>17,976</td>
</tr>
<tr>
<td>High</td>
<td>28,000</td>
<td>58,000</td>
</tr>
<tr>
<td>Low</td>
<td>1,392</td>
<td>4,000</td>
</tr>
<tr>
<td>Median</td>
<td>14,543</td>
<td>16,451</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>90%</td>
<td>89%</td>
</tr>
</tbody>
</table>

Notes: Weighted averages for vehicle mileage remain fairly constant from year to year. It is interesting to note that the company with truck mixers that averaged the lowest per year mileage - only 1,392 miles in one year - operated its trucks at a dedicated portable plant located very close to the construction project.

6. Average Engine Hours/Year: 1,974

<table>
<thead>
<tr>
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<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>1,974</td>
<td>1,940</td>
</tr>
<tr>
<td>High</td>
<td>3,100</td>
<td>3,500</td>
</tr>
<tr>
<td>Low</td>
<td>960</td>
<td>1,000</td>
</tr>
<tr>
<td>Median</td>
<td>1,831</td>
<td>1,809</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>82%</td>
<td>73%</td>
</tr>
</tbody>
</table>

Notes: The engine hour values reported in the survey remain very steady from year to year. Most concrete producers feel engine hours are a better indicator of truck mixer wear and aging than mileage. This is due to two factors: a) truck mixer mileage is quite low compared to most heavy trucks and b) annual truck mixer mileage is often much higher at rural versus urban concrete plants.

7. Average Haul Distance (One-Way): 14.1 miles

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
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<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>14.1</td>
<td>14.6</td>
</tr>
<tr>
<td>High</td>
<td>32</td>
<td>40</td>
</tr>
<tr>
<td>Low</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Median</td>
<td>13</td>
<td>14.1</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>82%</td>
<td>84%</td>
</tr>
</tbody>
</table>

Notes: Average haul distance is another example of a key industry statistic that does not change much from survey to survey. This low year-to-year variation confirms the statistical veracity of NRMCA Fleet Benchmarking and Cost Survey efforts.

8. Average Load Size: 8.1 Cubic Yards

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>8.1</td>
<td>8.1</td>
</tr>
<tr>
<td>High</td>
<td>10</td>
<td>10.5</td>
</tr>
<tr>
<td>Low</td>
<td>6.5</td>
<td>6</td>
</tr>
<tr>
<td>Median</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>99%</td>
<td>94%</td>
</tr>
</tbody>
</table>

Notes: These values represent the average size of all truck loads, including short loads.

9. Average “Full” Load Size: 9.8 Cubic Yards

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>9.8</td>
<td>9.6</td>
</tr>
<tr>
<td>High</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Low</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>96%</td>
<td>92%</td>
</tr>
</tbody>
</table>

Notes: Lighter-weight truck mixers, exploitation of new chassis configurations, and more efficient dispatching all impact slowly increasing permissible “full” load sizes.

10. Average Total Maintenance Cost/Cubic Yard: $3.52

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>$3.52</td>
<td>$3.21</td>
</tr>
<tr>
<td>High</td>
<td>$7.28</td>
<td>$10.00</td>
</tr>
<tr>
<td>Low</td>
<td>$0.83</td>
<td>$0.70</td>
</tr>
<tr>
<td>Median</td>
<td>$2.92</td>
<td>$2.99</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>88%</td>
<td>89%</td>
</tr>
</tbody>
</table>

Notes: Significant sub-values within total maintenance cost of $3.52 per cubic yard include: $1.55 Shop Cost, $0.42 Outside Repairs, $0.17 Radio Expense and $0.31 Tire Expense.

11. Tire Cost: $0.31/Cubic Yard

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>$0.31</td>
<td>$3.21</td>
</tr>
<tr>
<td>High</td>
<td>$0.58</td>
<td>$0.66</td>
</tr>
<tr>
<td>Low</td>
<td>$0.11</td>
<td>$0.11</td>
</tr>
<tr>
<td>Median</td>
<td>$0.30</td>
<td>$0.30</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>98%</td>
<td>89%</td>
</tr>
</tbody>
</table>

Notes: Tires have always been one of the most significant and closely watched fleet maintenance costs. The survey averages stay consistent on tire costs year to year, with understandably higher costs for fleets that operate truck mixers with five, six or seven axles compared to three or four axle trucks.

12. Basis of PM Interval

Participating ready mixed concrete companies based their scheduled truck mixer preventive maintenance (PM) on:
• 71% - engine hours
• 18% - calendar days
• 7% - mileage
• 2% - fuel consumption

13. Fuel Consumption - Avg. MPG: 3.4*

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>3.4</td>
<td>3.6</td>
</tr>
<tr>
<td>High</td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Low</td>
<td>0.94</td>
<td>2.0</td>
</tr>
<tr>
<td>Median</td>
<td>3.32</td>
<td>3.4</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>89%</td>
<td>84%</td>
</tr>
</tbody>
</table>

Notes: Monitoring miles per gallon for truck mixers is perhaps more meaningful for in-house benchmarking than for collaborative benchmarking efforts that look at the whole industry. After all, some companies operate in the mountains and have a high average haul distance, while others operate in flat, urban areas with a small-radius delivery area.

14. Fuel Consumption - Avg. Gallons/Engine Hour: 2.8

Notes: Analyzing fuel consumption on a ‘per-engine-hour’ basis is important. This data is not always reported consistently, nor is it addressed by all the survey participants. The Operations Task Group has targeted this item as an area for improvement in the benchmarking survey.
15. Fuel Consumption - Avg. Gallons/Cubic Yard: 1.06

Notes: For years, it has generally been acknowledged that a truck mixer engine burns approximately a gallon of diesel fuel for each cubic yard of concrete delivered. Higher fuel costs have pushed improving fuel-efficiency to the top of the list of variable cost that ready mixed producers want to reduce.

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>2.8</td>
<td>2.7</td>
</tr>
<tr>
<td>High</td>
<td>7.0</td>
<td>7.34</td>
</tr>
<tr>
<td>Low</td>
<td>0.57</td>
<td>0.33</td>
</tr>
<tr>
<td>Median</td>
<td>2.92</td>
<td>2.82</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>57%</td>
<td>57%</td>
</tr>
</tbody>
</table>

16. Fuel Consumption - Avg. $/Cubic Yard: $2.80

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. of Reported #’s</td>
<td>$1.06</td>
<td>$2.55</td>
</tr>
<tr>
<td>High</td>
<td>$4.62</td>
<td>$5.04</td>
</tr>
<tr>
<td>Low</td>
<td>$0.79</td>
<td>$0.25</td>
</tr>
<tr>
<td>Median</td>
<td>$2.71</td>
<td>$2.50</td>
</tr>
<tr>
<td>% Participants Reporting</td>
<td>89%</td>
<td>88%</td>
</tr>
</tbody>
</table>

Notes: Measuring fuel consumption on a dollars-per-cubic yard basis aligns very closely to diesel fuel per-gallon price, since truck mixers consume about a gallon of diesel per cubic yard. We anticipate next year’s survey will show a significant jump in this cost, as diesel fuel process rose to a high of over $4.70 per gallon in the summer of 2008. This table shows a 10-year history of our survey’s results for fuel consumption on a dollars per cubic yard basis:


17. Mixer Drum Life and Chipping

- Average Drum Life, Years: 5.7
- Average Drum Life, Cubic Yards: 39,052
- Average Chipping Interval: every 6.1 months
- Who does the drum chipping?
  a. 78% of respondents: Outside contractor/chipping service
  b. 14% of respondents: Drivers
  c. 4% of respondents: Combination of drivers and contractor/service
  d. 5% of respondents: Maintenance staff

18. Front-end Loader Maintenance Costs

- 1,537 Front-end loaders reported (18 per company)
- Avg. Front-end loader Age: 9.0 yr.
- Loader Tire Cost:
  a. per cubic yard: $0.31
  b. per engine hour: $1.90
- TOTAL Loader Maintenance Cost:
  a. per Cubic Yard: $0.51
  b. per Engine Hour: $12.59

Questions about the Fleet Benchmarking and Cost Survey should be addressed to Greg Vickers, managing director of operations: 240-485-1136 or e-mail: gvickers@nrmca.org. NRMCA members are encouraged to participate in the next survey, which will be available at the beginning of the year with a submittal deadline of May 1, 2009.
A New Year, A New Congress Bring Optimism for Industry Advocacy

By Kevin Walgenbach, Director of Government Affairs, NRMCA

In 2008, the ready mixed concrete industry saw numerous accomplishments. In concert with others holding a stake in transportation infrastructure, the ready mixed concrete industry successfully lobbied Congress to transfer more than $8 billion from the U.S. Treasury into the Highway Trust Fund. This infusion of cash helped prevent states from losing nearly 34% of their federal transportation dollars and saved over 370,000 American construction jobs. The industry not only raised awareness to unprecedented levels about the misleadingly named Employee Free Choice Act, but managed to do tremendous fundraising in order to better fight such onerous legislation. There was also significant headway made on implementing more robust federal building codes as criteria for participation in the National Flood Insurance Program and on obtaining an industry exemption for certain portions of the federal Hours of Service regulations for commercial motor vehicle operators.

Building on this list and other 2008 industry accomplishments; 2009 and the 111th Congress have promise for bringing many new successes. The ready mixed concrete industry is ready and willing to tackle a vast range of issues in 2009.

The ringing in of 2009 does not just mean a new President and new Members of Congress, but also marks the expiration of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The expiration in September 2009 of SAFETEA-LU, which was passed by Congress in 2005 to fund Federal surface transportation programs for the 5-year period 2005-2009, has stirred a frenzy of lobbying activity in hopes of securing a bigger and better transportation funding bill. The hope is that the next bill will be somewhere in the range of $500 billion, a big step up from the $285 billion authorized for SAFETEA-LU. Not only could the bill allocate more money, but it is believed it will incorporate a major sustainability theme.

Also on the burner for the next Congress is climate change. The ready mixed concrete industry is currently weighing the implications of climate change legislation on the industry. Already, there are lobbying efforts underway to ensure the economic security and prosperity of the industry should such legislation pass Congress and be signed into law.

One of the biggest returning issues facing businesses in the next Congress is Card Check. As mentioned above, many have been informed about the Employee Free Choice Act and a lot of money has been raised to combat this legislation, however there is more work to be done. In order to protect a worker’s voice, workers’ rights and keep in place private ballot elections for workers deciding on whether to unionize their workplace, it is critical that our industry keep this issue front and center.

Although transportation funding, climate change and Card Check will play a large role next year and in years to come, there are many other issues that won’t take a back seat. The industry is ready, organized and eager to lobby for relaxed truck weight restrictions on federal-aid highways; it is mobilized to fend off attempts to give the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers unlimited regulatory control over all intrastate waters; it is on the cusp of establishing more robust building codes as requisite criteria for construction in a floodplain; and, the industry is just a stone’s throw away from obtaining a much deserved, industry-wide tax credit for fuel used by equipment powered by a separate engine; known as power take-off (PTO).

Regardless of what surprises and work 2009 and the 111th Congress bring, the ready mixed concrete industry is excited about the many possibilities for industry growth and economic achievement.

For more information about NRMCA’s government affairs program, contact Walgenbach at kwalgenbach@nrmca.org or 240/485-1157.
Part 8: Disaster Resistant Construction

Concrete Doesn’t Just Come In Vanilla Anymore

By A. Vance Pool, Senior National Resource Director, NRMCA

This is the eighth article in a series on many of the different types of value added concrete you can choose to include on your menu of products to actively promote in a local marketplace. Some of those choices include concrete with fibers, quick setting mixes, decorative concrete, waterproof concrete, flowable fill, self consolidating concrete (SCC), easy finishing mixes, “Green” concrete, pervious concrete, high strength concrete, low initial cost concrete, disaster resistant construction and corrosion resistant concrete. In our last article we highlighted the applicability of Low First Cost Concrete and how to actively sell and promote it. Having just ridden out Ike on the Gulf Coast and with first hand views of the devastation, it is timely for me to write on disaster resistant construction using concrete. This article will take a look at the technology and the social and economic justifications for concrete home construction.

So what qualifies me to write on this topic? I moved to South Florida a few weeks after Hurricane Andrew devastated Homestead and read the reports from the universities on the types of construction that fared the best. I traveled to southern Louisiana days after Andrew reemerged there. I visited New Orleans a number of times in the weeks and months after Katrina and saw not only the physical damage it caused but also witnessed the exodus of people to Baton Rouge and elsewhere in its aftermath. I saw the major number of Katrina refugees who were taken care of by the City of Houston and the State of Texas in the days and weeks following Katrina. I have boarded up my home six miles from the Gulf of Mexico numerous times this year. And, as previously noted, I sat through Ike with 100 mph gusts and 40+ mph sustained winds for 10 hours last month. Lastly, using press credentials from this magazine, I recently toured Galveston Island before residents were allowed to return to their homes.

Following Katrina, CNN had a film clip of a concrete home in Mississippi that survived relatively unscathed, albeit with water damage from the excessive tidal surge. It looked like Hiroshima (site of the first nuclear bomb in WWII in case you are too young to know) with empty slabs and broken trees surrounding this lone outpost of civilization in the area. Unfortunately, it aired in the morning and few people actually saw it. I witnessed our industry’s strong efforts in numerous states to beef up coastal building codes to prevent this kind of tragedy from happening again.

The economics of our taxes being used to repair and replace devastated homes and infrastructure on a repeated basis in these coastal enclaves not only adds to our deficit, it angers me that we can be so short sighted...
as a nation. Much of the monies pumped into these areas will have to be done again, because it is not a question of whether or not it will happen again, it is only a matter of time. Global warming advocates predict more and stronger hurricanes because of our CO₂ emissions and they are likely correct.

When Ike hit the Texas gulf coast, Galveston received the bulk of the media coverage, but due to a last minute turn of the storm, the hardest hit area was the Bolivar Peninsula, or should I say the Bolivar Islands since the peninsula was destroyed and a handful of islands cut off from civilization exist today. Many homes were washed out to sea, and the count of missing people from Texas still numbers around 200, with slightly under 40 people pronounced dead. How long will our nation ignore the fact that most islands in the Gulf should build homes from concrete or concrete block which would weather these storms repeatedly?

Stick built construction can be designed to perform reasonably well in these situations; however, the safest bet is found in concrete construction methods. Whether insulated concrete forms (ICF www.forms.org), tilt-up construction (http://www.tilt-up.org) or traditional cast in place, walls and roofs can weather the storm. With only slight additional cost over traditional stick built, it amazes me that we cannot move the coastal communities of the United States to adopt these proven technologies exclusively.

The photos show a storage center 2 miles from my home, a house collapsed which was beyond the protection of Galveston’s seawall and a house that survived but is leaning so severely that I wonder if it can be repaired economically. Unfortunately there is no way for me to get to Gilchrest and Crystal Beach on the Bolivar peninsula to photograph the carnage. The link http://abclocal.go.com/ktrk/story?section=weather/hurricane&id=6392425 will show you a video of the massive destruction. The lone home standing in Gilchrest is rumored to be ICF but I have been unable to confirm this so far. You can see that this is much worse than most across the country thought. As many as 40% of the Galveston Island inhabitants were stated to have not left the island under mandatory evacuation and my friend, a Galveston police officer, confirmed that many stayed despite the warnings. Many of the 200 missing are from Galveston or Bolivar.

Homes constructed of concrete wall systems have survived hurricanes, fires, tornadoes, floods and just about any type of disaster known to man. The data is undisputable. We need to spread the word and try to keep these events from devastating the lives of those in the path of both the winds and the storm surge in Florida and along all of the Gulf and East Coasts. With significantly lower heating and cooling costs as well as the survivability and financial losses being suffered, when will America wake up and take action?

For more information, contact Vance Pool at 281/557-8415 or via e-mail at vpool@nrmca.org.
ERIE concrete batch plants meet the application, production and job size requirements of all ready mix producers, and they're backed by a century of construction equipment manufacturing experience. Supervisors are confident knowing an ERIE plant is at work on their jobsite.

Contact an ERIE representative:
P.O. Box 1031, Erie, PA 16512 • Phone: (814) 456-7001 • Fax: (814) 452-3422
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Introduction

The Business Administration Committee of the National Ready Mixed Concrete Association annually administers the Industry Data Survey. The survey is a benchmarking tool against which companies in the ready-mixed concrete industry can measure their performance. The survey is confidential in that all information submitted by each company is submitted directly to and compiled by an independent certified public accounting firm. Individual company details are restricted to the company submitting the survey and the accounting firm.

Summary of Results

There were 193 respondents to the 2008 survey, a 12% increase over 2007 survey results and a 56% increase from 2006. The increase from last year was broad with almost all reporting categories showing an increase in participation. The notable exceptions were companies producing over 500,000 cubic yards and those companies in the Southeastern region, with decreased participation of 13% and 22%, respectively. Average sales for the 193 respondents was $60,385,560 or 657,222 cubic yards, down 17% and 25%, respectively, from 2007 levels of $72,742,605 and 866,414 cubic yards.
The average net sales price per cubic yard of concrete for a “Typical NRMCA Member” increased almost 2% from $90.31/cyd in 2006 to $91.88/cyd in 2007, a net gain of $1.57/cyd. For 2007, “Industry Leaders” or the “Upper Quartile” that fell into the top 25% of overall performance had an average net sales price of $97.57/cyd, growing from $94.92/cyd in 2006, a net gain of $2.65. For the “Lowest Quartile”, the average net sales price per cubic yard of concrete also increased, gaining $4.61/cyd or 5.5% over the 2006 number of $83.39. Pre-tax profit for the typical NRMCA member decreased from $7.63 to $6.06 (-21%), while pre-tax profit for industry leaders dipped slightly in 2007, moving from $10.62 to $10.42 (-2%). For the “Lowest Quartile,” pre-tax profit was level at $1.49 vs. $1.52 in 2006.

The tables show the breakdown and the key variances.
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MORE THAN 40,000 sq. ft. OF PRODUCTION AND WAREHOUSING FACILITY
It’s Not Always the **What** But Often the **How**

By: C. Stephen Jones, Jr., MBA, SPHR, Director, Human Resources & Safety, Chandler Concrete Company, Inc.

A sk an employee to list the top three areas for improvement at his or her company and you will most likely see communication somewhere on the list. While communication is accepted as an important part of every job, an effective communicator is usually valued in most organizations regardless of job title or duties. Focusing on your personal communication skills can increase your overall value in your organization.

We regularly communicate in three primary ways: verbally, non-verbally and in writing. Your ability to understand when, where and how to use each effectively will help separate you from others in the organization. There is typically a higher value placed on communications than most other skills and abilities. That’s because an effective communicator can give and accept ideas that encourage and foster teamwork, which in turn helps the organization achieve its goals.

Some might argue this point. There are some who believe that the true value of an employee is determined solely by the results they achieve. They will often tell you that the means justify the ends. If the person is not an effective communicator, it must be everyone else’s problem. Just look at their results. The bottom line is all that matters. But is it really?

Let’s look at the three primary methods of communicating before we answer.

**Verbal**

Most of us have heard the saying that sticks and stones will break my bones but names will never hurt me. But most of us have also learned that **HOW** something is said is as, or more, important than **WHAT** is said.

Think of words as packages and wrapping paper for thoughts and ideas which are your presents. You should carefully pick your packaging and wrapping paper to make sure they are appropriate for your gift.

Some call this “sugarcoating” because it might seem indirect or cumbersome. But being direct with your words can be like buying a birthday or Christmas present and just handing it to the recipient without wrapping it.

Sure the gift is the same but the way it is wrapped will greatly determine the way it is accepted. Unwrapped it’s cold and uncaring, just as the direct spoken word can be if the words are not chosen carefully.

For example, if you have to hold a discussion with a driver about an unacceptable behavior, it’s important to choose words that foster teamwork, which in turn helps the organization achieve its goals.

Does it take more time? Yes. Does it build a better relationship and support a culture of care and concern for an employee. Absolutely.

Effective communicators understand the importance of “packaging” their message. They know that using proper English when speaking, maintaining one’s self-esteem when communicating difficult information, acknowledging emotion and asking open-ended questions to ensure understanding are key tools to effective verbal communication.

**Non-Verbal**

I am sure you are familiar with the saying that actions speak louder than words.
We speak volumes every day without opening our mouths or saying a word. We are communicating with every expression, gesture and move that we make. From the clothes we wear to the style of our hair we are making wordless statements to be freely interpreted by others.

While it’s nice to think that we will be judged by our results and our actions alone, in reality we are being judged based on the consistency (or inconsistency) of our total “package.” That includes our actions and our words. We have heard it before…talk the talk and walk the talk. Problems occur when the spoken or verbal message is inconsistent with the non-verbal message. Consider this example:

Scenario

The plant manager regularly encourages the employees he supervises to come to him with questions and concerns. One day an employee comes in to see him about a problem he is having with his truck and while the employee is talking, the manager continues working on some paperwork and also asks the employee to wait while he answers his ringing cell phone.

The message from the non-verbal cues (multi-tasking, not giving the employee his undivided attention including direct eye contact and acknowledging head gestures) is that the manager doesn’t really care. Is this true? Probably not, but the impact of his non-verbal cues are much stronger than his unspoken intent.

Effective communicators understand this and the importance of non-verbal communication. Active listening, facial expressions, gestures and clothing all send messages. Effective communicators take time to consider the power of non-verbal communications.

Written

The age of e-mail and instant messaging have taken a toll on our ability to write complete and coherent sentences. Many people in today’s business environment rely on electronic means of communicating. This method has evolved with informal rules that often fly directly in the face of the basic rules of written communication that we learned in school.

The effective communicator understands the value of the written word. Do not discount the importance of writing in complete sentences using appropriate words, phrases and proper punctuation as well as staying focused on issues and not emotions. Even something as simple as proofreading can go a long way in making your written communications more effective.

Consider the following example:

Please send me your monthly reports on yardage and trips as soon as you can or at least by Friday because I need to get them as soon as possible to summarize so I can send them to accounting so they can prepare the financials before the end of the quarter. If you need my help you can call me or come see me, but make sure that you sent them by email so there is a record of when you sent them.

Restated

Please send your monthly yardage and trip reports to me by email no later than Friday. If you have any questions or need my help, please call me.

When revised, the statement is clearer, more concise; it contains fewer written words without losing the content.

Written business communications should be concise, recognizing that the reader has a limited amount of time and attention span. Ideas and thoughts should be clearly communicated giving consideration to the reader’s knowledge of the subject and what the reader needs from the written communication.

Improving in each of these areas is a continuous process. But it does take work and effort. Like any skill, you have to honestly assess your strengths and weaknesses and then make a commitment to improve. Only then will you begin to see sustained improvement.

And don’t forget, while actions may speak louder than words, words can make a lot of noise. Effective communication is not based on your intent but on your impact—and you can control both.

Contact Mr. Jones at 336/226-1181 or via e-mail at Steve.Jones@ChandlerConcrete.com. For more information about NRMCA’s educational programs contact Eileen Dickson at 240/485-1164 or via e-mail at edickson@nrmca.org.
Dramix® and the ready mixed concrete industry working together to build a solid foundation

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Sure, you could easily herd all your ready mix employees, department by department, crew by crew, into a classroom. Donuts are there, huge urns of coffee at the back, and employees will listen to presenters discuss safety. Maybe a recycled PowerPoint presentation? Maybe not. Sound familiar? Sound too familiar?

Texas Industries, Inc. in Dallas, the winner of this year’s NRMCA Innovation in Training Award, quickly realized that a more innovative and effective approach was needed to increase personal ownership of safety and recognize the value of OSHA safety training for its hundreds of ready mix division employees spread over Texas, Arkansas and Louisiana. The approach that was chosen is in plain sight of anyone who’s walked through an airport or needed cash from a bank ATM – interactive, on-site e-learning kiosks customized with short ani-
mated presentations on such topics as fall protection and crystalline silica. The company also produced a 4-minute video that features various safety topics, employee testimonials and brief interviews with the staff that helped to create the program.

NRMCA recognizes the challenges of its member companies to educate and train employees and the effort needed to take different approaches to accomplish such tasks. That’s why the Association has instituted an annual Innovation in Training Award that recognizes the most innovative ready mix producer training initiative in the previous year. Each of the winners has demonstrated a commitment to training through creative training programs that enhance the employees’ and company’s performance.

Any NRMCA member company in good standing that produces ready mixed concrete from a fixed plant location in the U.S., its territories or Canada is eligible to enter. This is a company award, though entries can be submitted for programs specific to a plant. Judges are the Concrete Industry Management faculty at Middle Tennessee State University who decide how member companies use materials and training methods to raise the performance level and commitment of its employees.

Thinking Inside the Box

In TXI’s case, the challenges inherent in any potential training program center on the fact that regulatory requirements, including OSHA, DOT and EPA, for the ready mixed concrete industry are very specific and off-the-shelf programs are very limited, said company Training Coordinator Kerri Todd. A proposal to address these issues through a new training program was sent to senior management by the five member safety and e-learning team in September 2007.

“Our previous training methods involved classroom training at a number of locations throughout the year, having the plant manager provide training through PowerPoint presentations on the first day of employment and monthly/quarterly safety meetings,” she explained. “These methods were time consuming for required training and operational demands required flexibility.”

Depending on the questions and discussions during each class, uniformity could vary and many students were hesitant to ask questions in front of their peers, Todd added. Documenting training, educating employees and confirming understanding of materials is time consuming and has many challenges. The kiosks have assisted TXI with conquering these obstacles.

To address these problems, TXI developed a series of interactive courses accessible from a computer placed at each ready mix location. The network-connected computer,
Each course could easily be completed between loads for mixer operators, and users reported that they found the courses both informative and entertaining, and retained information better. Managers are now easily able to track compliance and can provide immediate access to training for newly-hired employees. TXI will initially produce 13 OSHA courses and expects to have them ready by mid-January 2009, Todd said. The possibilities are endless for adding additional required courses and self-improvement programs for all employee groups on any training subjects.

For more information on TXI’s employee training program, contact Kerri Todd at 1-972-647-3761. For more information on NRMCA’s extensive list of membership awards programs and how to apply, view http://www.nrmca.org/products/awards.asp or contact NRMCA’s Kathleen Carr-Smith at kcarrsmith@nrmca.org or 1-888-846-7622, ext. 1145.

The challenges inherent in any potential training program center on the fact that regulatory requirements for the ready mixed concrete industry are very specific.
You are building an empire. You go to battle every day fighting to gain larger market share, defeat your competitors and capture new customers. The obstacles you encounter as a business owner are similar to the challenges that world conquerors faced centuries ago. What principles did world conquerors use to build their empires? How can those lessons be used to further your business success?

Genghis Khan’s approach to world domination was based on following a series of warrior management traits — operating tenets that formed the foundation for his success. Not surprisingly, these same traits can be used to achieve business success. Getting past the savagery that marked Genghis Khan’s reign, his structured approach to gaining world domination was simple, direct and replicable. This article shows you how to be a world conqueror — how to utilize warrior management traits to build your business empire.
1. Adapt to the ever-changing environment

A small construction company contemplated its strategic initiatives for the coming year – a year marked with the lowest expected new home starts in a generation. The managers, filled with bravado, sought to better their peers by offering measurable objectives for the year that were outlandish given the current market conditions. After boasts of 10, 25 and 100% growth were offered as targets for the year, a quiet voice of reason came from the back of the room: “I hope we don’t go out of business”. The room became hushed and the reality of the market environment was realized. Survival, not growth, was the objective for the year.

Genghis Khan realized that certain aspects of his empire were outside his control. For example, the weather was an uncontrollable aspect that had a direct impact on his battle plans. Instead of fighting what he could not control, he used his knowledge of the weather to complement his strategies (i.e., only attack China in the fall when the low humidity is ideal for bowstring tension making arrow flight more accurate). He chose to embrace, not fight, those variables he could not change.

2. Focus on achieving one objective at a time

Visiting a small technology firm in the United States, I happened to ask for a copy of its recent strategic planning document. The owner found a copy on his bookshelf, blew off the collected dust that had formed on it and handed it to me. As I thumbed through the beautifully bound plan, I noticed that the firm had documented a series of 156 tasks to be completed during the year. When I asked how many had been accomplished, the owner shrugged his shoulders and indicated that none of them had been completed. It (the firm) didn’t know where to start the implementation.

Genghis Khan followed the premise of achieving one objective at a time. With limited warrior resources, it didn’t make practical sense to send fragments of legions into multiple battles simultaneously. Using only partial resources to fight, the natural outcome would be a huge loss of personnel with little, if any, progress to show for their efforts. It was better to utilize his resources to conquer one “enemy” at a time – ensuring success as well as protecting his warrior resources for the next conquering initiative.

With the New Year right around the corner, annual planning exercises are well underway. You are wrestling with the issues of adding new employees, increasing the diversity of your offerings, changing pricing structures, seeking new distribution channels, and any myriad of other changes to your business dynamics. Ask yourself the simple question: what three activities must I complete this year to move my business forward? The answer forms your battle plan – the foundation of next year’s success.

3. No Personnel Transfers

A small architect and design firm has the enviable statistic of only losing one employee over the last five years – a remarkable employee retention rate. It turns out that the firm only hires entry-level employees right out of the university and never hires individuals to fill slots in the mid and higher tier management positions. The rationale is simple – individuals right out of the university don’t have any “bad habits” that need to be broken. They are a clean slate that can be taught the business consistent with the firm’s policies and practices. Conversely, individuals who have already accumulated practical experience come to the firm with “baggage” that can never seem to be undone.

Genghis Khan followed a similar philosophy that forbade any personnel transfers between his officer’s battalions. His concern was that if individuals believed that they could transfer between officers, there would be no loyalty to any single battalion. It was plausible to assume that in time of battle, these individuals would seek a more comfortable existence and try to remove themselves to another less-risky environment.

This warrior management trait should not be viewed as an impediment to transferring individuals in your firm between practice managers. It should, however, point out the value of obtaining talent to fill the junior levels in your firm and actively growing it to assume greater levels of authority over time. If it learns your culture – the success (and yours) is assured.

4. Sharing the Spoils

A small services firm wrestled to implement a performance-based compensation system. The problem wasn’t with the system but the insecurities of the owner. He believed that every employee should be limited to the amount of compensation he or she could earn – regardless of the contribution. He failed to realize that by providing unlimited upside incentive to a high performer ensured a greater value return to him.

As Genghis Khan was known to reflect, numerical superiority never won a battle – cunning and effective operations were the key to growing his empire.

Every business encounters uncontrollable environmental constraints. These constraints come in the form of laws, availability of raw materials, competition, the economy and labor costs. You can’t change them and to ignore them can bankrupt your business. The prudent approach is to embrace these constraints and leverage them as part of your business solution. After all, the same constraints that affect your strategies are being felt by every other business in your industry.

Genghis Khan believed in sharing the spoils with his troops. When a region was overrun, the troops shared in the bounty. There was no plan that indicated that any individual could only have a “capped” amount of compensation. Under that philosophy, the warrior troops would probably have sat around contemplating the value of battle – especially for those that had already received their total compensation for the year!

The lesson is simple – don’t bind the compensation of any employee in such a way that it limits performance. Even in this day and age where “life balance” is often used to reflect the boundaries between work and personal time, high performers still realize the value of achievement and, in most cases, are willing to work to obtain higher levels of compensation. You should be excited to find these employees and, in turn, provide them with a framework for unlimited rewards.
5. Speed of Execution

Small businesses share a trait that larger businesses cannot emulate – speed of execution. Most small firms pride themselves on being flexible, nimble and able to leverage market opportunities quickly. Larger corporations, because of their bureaucracy, fall prey to analysis paralysis and are often beaten to the market by smaller competitors. Once in the market, the smaller firms are able to gather market share, quickly putting the larger firms at a disadvantage.

Genghis Khan recognized that opportunity was fleeting. Infinite patience was necessary to ensure that all the attributes for success were in place prior to leading an offensive charge. And, once in place, the window of opportunity was small necessitating quick action on his part. Much of his success was based on his speed of execution – to immediately act when all the pieces fell into place.

What attributes need to be present for your business to succeed? When is action warranted or, conversely, when is patience prudent? As a business owner you need to be ready to move quickly to leverage nuances in your market. Waiting on the sidelines only allows your competition to make its move.

In fairness, the history of Genghis Khan portrays a brutal individual. But, beyond the savagery of his methods, he employed an effective framework that continues to be emulated today by successful businesses. As a small business, you are in a position to effectively implement many of the warrior management traits. As Genghis Khan was known to reflect, numerical superiority never won a battle – cunning and effective operations were the key to growing his empire.

Today, you sit atop your own empire. What direction will you go? How will you effectively leverage your marketplace? Many of you will continue to follow the “lessons” learned through traditional business methods – the same ones followed by larger, more lethargic, corporations. You have a choice, moreover, a challenge to discard your present mentality and adopt an historic perspective – that of a warrior. Are you ready to be a conqueror?

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Concrete Producer, or Hazardous Waste Generator?

By Douglas Ruhlin, Principal Environmental Consultant, Resource Management Associates

It might surprise concrete producers to find that they are both concrete producers and hazardous waste generators. Most would never consider themselves to be in the hazardous waste business and they’re generally right. However, an understanding of the regulations behind hazardous waste generation might point out that many producers fall under both federal and state waste regulations.

Waste Regulations

Wastes are regulated on the Federal level under the Resource Conservation and Recovery Act (RCRA), the goal of which is to protect human health and the environment and to conserve valuable material and energy resources. RCRA regulates solid wastes, hazardous wastes and underground storage tanks, and also provides a regulatory framework to be followed by state or regional waste regulatory agencies (i.e., state or regional environmental agencies). The RCRA regulations are broken up into nine chapters, or subtitles, with subtitle C being the area of RCRA that primarily deals with hazardous wastes. Subtitle C describes how hazardous wastes are generated and establishes standards for the accumulation, transport, storage, treatment and disposal of hazardous waste. It also regulates hazardous waste from the point a waste becomes hazardous, until it is no longer a hazardous, or from “cradle to grave.” Most states have their own version of the federal solid and hazardous waste regulations, which may differ from the RCRA regulations.

What is Waste?

Solid waste is a material that is no longer valuable in its current state for its intended use and is either discarded or processed to manufacture a process (recycled). If a material is a solid waste, it may also be a hazardous waste, which are classified either on the basis of their characteristics (a “characteristic hazardous waste”) or by their specific identification on listings of hazardous wastes (“listed hazardous wastes”). Many materials that are recycled are specifically exempt from the solid and hazardous waste definitions.

There is also a subset of hazardous wastes, known as “universal wastes,” which are typically common materials that are recycled or otherwise managed. These typically include used oil, used oil filters, lead-acid batteries, certain types of lamps, CRTs, and other similar materials. The regulations that pertain to these materials are simpler, and designed to promote property treatment and recycling of these materials. Most states have their own universal waste regulations, which may differ from the Federal RCRA regulations.

Are you a Generator – Registration Requirements

A hazardous waste generator is any person, by site, whose act or process produces hazardous waste, or whose act first cause a hazardous waste to become subject to regulation. If you are a hazardous waste generator, you must obtain a waste generator registration under federal and/or state regulation. There are three categories of hazardous waste generators, depending upon the volume of hazardous wastes generated on a monthly basis:

- **Conditionally Exempt Small Quantity Generators (CESQGs)** – Generate less than or equal to 100 kilograms of hazardous waste per month (220 pounds, or about ½ of a 55-gallon drum) and accumulate less than 1,000 kilograms of hazardous waste on site at any one time.
- **Small Quantity Generators (SQGs)** – Generate more than 100 kilograms (220 pounds) but less than 1,000 kilograms

The proper management of all waste materials fits in well with the sustainability concept that the concrete industry is embracing.
(2,200 pounds, or between ½ and five 55-gallon drums) of hazardous waste per month and accumulate less than 6,000 kilograms of hazardous waste on site.

- **Large Quantity Generators (LQGs)** – Generated more than 1,000 kilograms of hazardous waste per month (>2,200 pounds or about more than five 55-gallon drums).

  Under the Federal regulations, if you are a SQG or a LQG, you must obtain an identification number from the U.S. EPA and/or your State regulations (who may also have different requirements, such as registration requirements for CESQGs). Also, as facilities generate and store more hazardous waste on site, various reporting, accumulation and operational requirements are triggered, providing incentive for a concrete facility to generate and store as little hazardous material as possible.

**What Hazardous Wastes Might a Concrete Plant Generate?**

Typically, a concrete plant facility would generate hazardous wastes if it has a vehicle repair or maintenance shop, although it remains possible that hazardous wastes may still be generated even if there is no shop. These facilities would likely generate both hazardous wastes (e.g., solvents, paint waste, acidic wastes, flammable materials, etc.) and universal wastes (used oil, used oil filters, lead-acid batteries, office lamps). It is important to a concrete plant producer to know exactly what materials that are generated that may be classified as hazardous or universal wastes (either characteristic or listed wastes), the volume of these wastes that are generated (which will determine generator status) and to know exactly what happens to these wastes after generation (i.e., the “cradle to grave” requirements).

**What About Concrete Materials?**

Excess concrete materials, such as returned concrete or concrete fines removed from a process water settling basin, have traditionally not been regulated as either a solid or hazardous waste in most areas of the United States. These are in fact highly recyclable materials and should be managed carefully at a concrete plant facility – mismanagement of these materials could result in the categorization of these materials as a waste material (mismanagement such as unpermitted landfilling, dumping these materials on or off the plant site with no further plan for recycling or reuse, disposal in an inappropriate manner, etc.). The best way for a concrete producer to prevent this is to ensure that all concrete materials generated at a site are part of an overall management plan and are recycled or reused in an appropriate manner in accordance with applicable regulations. Proper management of concrete materials remains the best way to ensure that waste regulations do not apply to concrete materials under most circumstances.

**What Should I Do?**

A concrete producer should recognize that it may potentially be a hazardous waste generator, and, as such, the following steps are recommended:
1. Consider conducting a waste audit of the concrete plant facility in order to prepare an inventory of all wastes generated. From this inventory, determine whether the wastes in question are solid wastes,
hazardous wastes, universal wastes or exempt materials. You may wish to have this audit conducted by personnel trained and knowledgeable about waste regulations and identification, and under the auspices of legal counsel.

2. Evaluate the presence of all types of wastes generated at the concrete plant facility. Consider eliminating or reducing those processes that generate wastes and see if environmentally-friendly, non-waste generating substitute products are available.

3. Determine the volume of all hazardous wastes generated and then determine the applicable waste generator status of the facility. If necessary, obtain proper waste generator registration from your state and/or federal U.S. EPA.

4. Evaluate carefully where all the waste generated at the concrete goes (remember the “cradle to grave” concept!). Ensure that wastes are managed, transported and disposed of only by reputable firms duly authorized and certified to handle and manage solid and hazardous waste. If your hazardous waste contractor mis-manages that waste in any way after it leaves your facility, you are still likely responsible for it!

5. Ensure that your concrete plant is appropriately managing concrete materials such as excess, returned concrete and concrete fines from settling basins. Have a management plan for these materials, and strive to recycle and reuse all these materials in an appropriate manner in accordance with all applicable regulations.

6. Ensure that your concrete plant uses the word “waste” only in appropriate instances. For example, it’s “used oil,” not “waste oil” (which is regulated differently than used oil, which is generally classified as a universal waste). And excess concrete materials that are to be recycled should never be called “waste concrete”!

It is also noted that the proper management of all waste materials, including efforts to reduce their generation and ensure appropriate disposition, fits in well with the sustainability concept that the concrete industry is embracing, and can be a highly effective part of a facility’s Green-Star Environmental Management System (Green-Star requires a facility to consider hazardous materials management as part of the continual improvement program).

Finally, in all cases, check with your state and/or regional solid and hazardous waste regulatory agency to ensure that you are aware of the regulations that apply to you in your particular state. You may also wish to seek appropriate legal counsel and/or consult assistance in this matter. □

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New Technology-Based Approach to Advance Higher Volume Fly Ash Concrete with Acceptable Performance

By Karthik Obla, Ph.D., P.E., Managing Director, Research & Materials Engineering, NRMCA

The 2006 fly ash use survey conducted by the American Coal Ash Association indicates that out of the 72.4 million tons of fly ash produced annually 45% was beneficially utilized; 59% of this was used in cement and concrete applications. Concrete is the largest market for fly ash and offers the highest potential for increased fly-ash utilization. While fly ash is routinely used in concrete, the actual use of high-volumes of fly ash (> 30% of total cementitious materials content) in ready mixed concrete is limited due to perceived lower early-age strengths as documented in research studies conducted in the laboratory with standard cured strength specimens.

The objective of this study was to demonstrate, using maturity-based techniques, that the actual in-place strength of High-Volume Fly Ash (HVFA) concrete in a structure is higher than that indicated by strength measured on field-cured cylinders due to the higher in-place temperature resulting from the slower dissipation of heat of hydration due to the greater mass of structural members. The in-place strength of concrete in the structure can be determined by monitoring its temperature history over time, calculating the maturity, and by estimating the in-place strength from the pre-calibrated strength-maturity relationship. The maturity concept assumes hydraulic cement concrete of the same maturity will have similar strengths, regardless of the combination of time and temperature yielding the maturity. Maturity concepts are well established for portland cement concretes but they are not so established for HVFA concrete mixtures containing chemical...
admixtures. The Arrhenius and Nurse-Saul maturity functions are commonly used to establish the maturity index. The Arrhenius maturity function is considered more accurate and was used in this study. The Arrhenius maturity function requires the use of mixture-specific activation energy to improve predictions of strength. The activation energy quantifies the temperature sensitivity of the concrete mixture.

An initial task was to determine the activation energy of each of the concrete mixtures using the procedure outlined in ASTM C1074. Various fly ashes (Class C and Class F fly ash meeting the standard ASTM C618) with multiple dosages (20% to 50% by mass of cementitious materials) were used in this study. Activation energies of these mixtures were determined. Some unexpected trends of strength based on curing temperature were observed for these fly ash mixtures. The fly ash mixtures cured at elevated temperatures demonstrated higher long-term strengths than anticipated in comparison to the strength of specimens cured at lower temperatures.

The next step was to develop strength-maturity relationships in the laboratory for four of the concrete mixtures. Additionally, pullout load versus compressive strength correlations were developed. To validate the strength predictions based on maturity, four concrete blocks and slabs were prepared in the field during the period of October to December, when the ambient temperature ranged from 15.5°C (60°F) to 7.5°C (45°F). The in-place compressive strength of the concrete blocks and slabs were predicted based on the following approaches:

1. Match-cured cylinders
2. Pullout testing using the pullout versus compressive strength relationship previously developed
3. Maturity based on the activation energy and strength-maturity relationship previously measured
4. Field-cured cylinders. Compressive strength of the concrete mixtures using standard-cured cylinders was tested at several ages. Based on the study the following preliminary conclusions were made:
   • For HVFA concrete, the large volume of structural elements will result in higher in-place temperatures and in increased early-age in-place strengths (measured by match-cured cylinders and pullout tests) compared with strength gain by cylinders under standard laboratory conditions. As a result, construction schedules may not have to be extended.
   • Field-cured cylinders underestimated in-place strength development, and standard-cured cylinders must not be used for estimating in-place early-age strengths. Field cured and standard-cured conditions are discussed in ASTM C31/C31M.
   • The maturity method and the pullout test are applicable to estimate the early-age concrete strength in structures made with HVFA concretes. The use of these methods will allow for increased fly ash content without adverse effects on the safety of early-age construction operations.

A guide for the construction team (contractor, concrete producer and engineer) that complements the report has also been developed. The guide provides a step by step procedure on the application of the maturity method to support the use of optimized HVFA concrete mixtures by providing a simple method to estimate in-place strength development. The seven steps of the guide are as follows:

1. Identify the early-age strength requirements for the specific structural application (such as for removal of forms, application of prestressing, early opening of pavements, etc.), and identify the age at which this strength needs to be attained; for example, a requirement of 2800 psi in 72 hours.
2. Choose appropriate concrete ingredient materials and establish HVFA concrete mixture proportions that will achieve the required early-age strength and other performance requirements.
3. Select the activation energy (AE) for strength development that most closely matches the selected cementitious materials.
4. Develop the strength-maturity relationship for the selected HVFA concrete mixture following the procedure in ASTM C1074.
5. Select the hydration parameters that most closely match the selected materials.
6. Conduct a thermal analysis and strength development simulation (with a computer program such as Concrete-Works) using the selected HVFA concrete mixture, the appropriate member geometry, the proposed construction sequence and the anticipated ambient temperatures.
7. Evaluate whether the selected HVFA mixture will meet the early-age strength requirements.
8. Once the project starts, the engineer oversees measurement of in-place maturity in accordance with ASTM C1074 and uses the strength-maturity relationship to estimate in-place strength during construction.

Both the final report and guide can be found at http://www.nrmca.org/research/eng_articles.asp.

References


The mission of the RMC Research & Education Foundation is to support research and educational programs that will increase professionalism and quality in the concrete industry. For more information on programs funded by the Foundation, please visit www.rmc-foundation.org.
It is estimated that 6% of all industrial fires are caused by welding and cutting operations that did not follow the prescribed OSHA and National Fire Protection Association (NFPA) standards for fire prevention during the welding and cutting. There are several OSHA standards covering this topic in 29 CFR 1910, Subpart Q - Welding, Cutting and Brazing. In particular, the definitions are found at 29 CFR 1910.251, Definitions, while the general requirements for all welding and cutting are found at 29 CFR 1910.252, General Requirements. Oxygen and fuel gas welding standards are found at 29 CFR 1910.253. The National Fire Protection Association (NFPA) 51B Standard for Fire Prevention during Welding, Cutting and Other Hot Work 1962 Edition is incorporated by reference. There is a new NFPA 51B 2009 Edition with an effective date of Sept. 25, 2008. The standards were put in place to ensure a minimum level of training and awareness so welders can operate their assigned duties safely. This month’s safety article will focus on Oxygen Fuel-Gas Welding and Cutting safety, a hot work permit system, fire watch and eye personal protective equipment to protect the welder and fire watch from the effects of optical radiation.

The first item to cover is the receiving and storage of oxygen and fuel gas at the facility. The gases should be stored inside, in a dedicated gas storage area and at least 20 feet from highly flammable/combustible items such as oil and gasoline. The areas should be marked well, well lit and have dedicated storage for each gas. Twenty feet or a five-foot one hour rated fire separation wall between the gases. The area must be well ventilated and be located away from steps, elevators or gangways and kept in areas where they cannot be knocked over or damaged by passing or falling objects.

Welding gases are heavier than air and will accumulate in low areas if there is a leak at the cylinder. All valve protection and cylinder caps are kept on and hand tight.

Now that we have received and stored the gases, it is time to place them into service and get a “Hot Work Permit” from management. Cylinders, cylinder valves, couplings, regulators, hose and apparatus shall be kept free from oily or greasy substances. If these substances come in contact with welding oxygen, a fire can start. The cylinders are now secured to the cylinder cart via a chain. The cylinders can now be moved to the welding position. After attaching the regulator and torch, you are ready to weld. Always open the cylinder valves slowly. An acetylene cylinder valve shall never be opened no more than one and a half turns of the spindle and preferably no more than three-fourths of a turn. Where a special wrench is required it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas can be quickly turned off in case of an emergency.

A permit to weld or create sparks is commonly referred to as a “Hot Work Permit.” A hot work permit is authorized by management and lets the welder commence work once all the fire prevention steps outlined in the hot work permit have been taken care of. One of the major items will be the removal of flammable/combustible materials from the area and having a fire watch on hand if there is potential for other than a minor fire. I don’t know what the definition of a minor fire is, but if there is a chance of a fire starting, make sure you have a fire watch. Even a minor fire can cripple operations for several days. A fire watch is trained to look for a fire in the incipient
Filter lenses for protection against radiant energy

<table>
<thead>
<tr>
<th>Operations</th>
<th>Electrode size (inches)</th>
<th>Arc current (amperes)</th>
<th>Minimum * protective shade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shielded metal arc welding</td>
<td>Less than 3/32</td>
<td>Less than 60</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>3/32 - 5/32</td>
<td>60 - 160</td>
<td>8</td>
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<td></td>
<td>5/32 - 8/32</td>
<td>160 - 250</td>
<td>10</td>
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<td></td>
<td>More than 8/32</td>
<td>250 - 550</td>
<td>11</td>
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<tr>
<td>Gas metal arc welding and flux cored arc welding</td>
<td>less than 60</td>
<td>7</td>
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<tr>
<td></td>
<td>60 - 160</td>
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<td>160 - 250</td>
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<td></td>
<td>250 - 500</td>
<td>10</td>
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<tr>
<td>Gas tungsten arc welding</td>
<td>less than 50</td>
<td>8</td>
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<td></td>
<td>50 - 150</td>
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<tr>
<td></td>
<td>150 - 500</td>
<td>10</td>
<td></td>
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<tr>
<td>Air carbon Arc cutting</td>
<td>(Light)</td>
<td>less than 500</td>
<td>10</td>
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<tr>
<td></td>
<td>(Heavy)</td>
<td>500 - 1000</td>
<td>11</td>
</tr>
<tr>
<td>Plasma arc welding</td>
<td>less than 20</td>
<td>6</td>
<td></td>
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<tr>
<td></td>
<td>20 - 100</td>
<td>8</td>
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<td>100 - 400</td>
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<td>400 - 800</td>
<td>11</td>
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<tr>
<td>Plasma arc cutting</td>
<td>(light)**</td>
<td>less than 300</td>
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<td>(medium)**</td>
<td>300 - 400</td>
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<td>(heavy)**</td>
<td>400 - 800</td>
<td>10</td>
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<tr>
<td>Torch brazing</td>
<td>3</td>
<td></td>
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<tr>
<td>Torch soldering</td>
<td>2</td>
<td></td>
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<tr>
<td>Carbon arc welding</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Filter lenses for protection against radiant energy during gas welding and oxygen cutting

<table>
<thead>
<tr>
<th>Operations</th>
<th>Plate thickness (inches)</th>
<th>Minimum * protective shade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas welding:</td>
<td>Light</td>
<td>Under 1/8 (3.2 mm)</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>1/8 - 1/2 (3.2 - 12.7 mm)</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>Over 1/2 (12.7 mm)</td>
</tr>
<tr>
<td>Oxygen cutting:</td>
<td>Light</td>
<td>Under 1 (25 mm)</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>1 – 6 (25 - 150 mm)</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>Over 6 (150 mm)</td>
</tr>
</tbody>
</table>

Notes:
* The acceptable practice for selecting the proper shade number is to start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the spectrum operation.

** These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the work piece.

At the end of the welding operation, welding gases are turned to the off position, terminate and archive the “Hot Work Permit,” fire watch remains on duty for 30 minutes to ensure a fire does not start or re-ignite and the gas cylinder cart is taken back to its dedicated storage area. Remember; welding, cutting and other hot work operations result in about 6% of all industrial fires. Even a small and minor fire can cripple an operation for days or weeks or it may not be economically feasible to rebuild the plant given the current business operating climate.

For more information about NRM-CA’s safety programs, contact Ayers at 240/485-1155 or via e-mail at dayers@nrmca.org.
there are several reasons why a concrete producer may need to change concrete material ingredients or proportions during a project. Some of these situations will require a re-submittal to the engineer of record (EOR) for review and/or approval. This article addresses one such issue related to compliance with strength provisions. It stems from a clause in ACI 301-05 that is incorporated in project specifications and has been interpreted contrary to the intent.

Background

The strength provisions for concrete are established on a statistical basis with due consideration of the implication to public safety of the constructed building. These provisions are addressed in ACI 318-08, Building Code for Structural Concrete, and ACI 301-05, Specifications for Structural Concrete. The provisions require a concrete producer to develop proportions for a proposed concrete mixture at an average strength, $f_{c'}$, that exceeds the specified strength, $f_c'$. The specified strength is used by the EOR to design the dimensions of the structural members. This is summarized below:

Acceptance Criteria for Concrete Compressive Strength

The acceptance criteria for concrete compressive strength (less than or equal to 5000 psi) are as follows:

- Average of three consecutive compressive strength test results $\geq f_c'$ (1)
- Individual strength test result $\geq (f_c' - 500)$ when $f_c' \leq 5000$ psi (2)
- Where $f_c'$ = specified compressive strength for the project
- Test cylinders should be molded and cured (standard curing) in accordance with ASTM C31/C31M.

The test result is the average of 2 or 3 cylinders tested at the same age.

Required Average Compressive Strength

To start the job, the concrete producer has to develop a proposed mixture and submit to the EOR that demonstrates that the proposed mixture has an average compressive strength ($f_{c'}$).

If the concrete producer has a past test strength test record of a similar class of concrete with at least 15 tests, he calculates the standard deviation and establishes the $f_{c'}$ in psi as the larger of the values from the following two equations:

\[
\begin{align*}
f_{c'} &= f_c' + 1.34ks \quad (3) \\
f_{c'} &= f_c' + 2.33ks - 500 \quad (4)
\end{align*}
\]

where $k$ = factor to modify the standard deviation if total number of tests is between 15 and 30; and $s$ = standard deviation.

From a purely statistical consideration, if the average of the concrete strength test results during the project are at $f_{c'}$, and the variability of these results is represented by the standard deviation used in equations 3 and 4, these strength provisions establish a probability of failing the acceptance criteria (Equations 1 and 2) at 1% or less. Also about 11% of the strength test results will be expected to be below $f_c'$. These are based on statistical concepts that assume that strength tests follow a normal probability distribution.

When the concrete producer does not have a recent field test record to establish a standard deviation, the ACI standards require the mixture be developed to achieve a higher required average compressive strength as follows:

\[
\begin{align*}
f_{c'} &= f_c' + 1000 \text{ (for } f_c' < 3000 \text{ psi)} \quad (5) \\
f_{c'} &= f_c' + 1200 \text{ (3000 } \leq f_c' \leq 5000 \text{ psi)} \quad (6)
\end{align*}
\]

It is a good idea that a concrete producer constantly monitors his strength test results and makes necessary revisions to mixtures when trending so suggests.
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Changes

Documentation that proposed concrete mixture proportions will produce required average compressive strength must be shown through field test records or lab trial batches in a pre-construction submittal.

Revisions to Concrete Mixtures

Article 4.2.3.6 in ACI 301-05 (paraphrased) states the following:

When 15 consecutive compressive strength test results become available during a project, calculate the actual average compressive strength and standard deviation from those test results. Calculate a revised value for \( f'_{cr} \) in accordance with Equations 3 and 4. Ensure that both the acceptance criteria (Equations 1 and 2) are met.

a) When the actual average compressive strength \( \bar{X} \) exceeds the revised value of \( f'_{cr} \) and both the acceptance criteria are met, \( f'_{cr} \) may be decreased. This reduction in the strength of a class of concrete is permitted by the ACI 318 Code (Section 5.5). There can be some significant material cost savings on larger projects with this provision. It permits a concrete producer to reduce his level of average strength if the project was started on the basis of not having a prior test record (Equations 5 and 6) or if there is improved quality control that is translated into a reduced variability (standard deviation) of the strength test results.

b) If the actual average compressive strength \( \bar{X} \) is less than the revised value of \( f'_{cr} \), or if either of the two acceptance criteria are not met, take immediate steps to increase average compressive strength of concrete. Steps to increase the average strength is a requirement in Section 5.6.3.4 of the ACI 318 Code, but only when strength tests fail the acceptance criteria (Equations 1 and 2). There is no requirement in the ACI 318 Code to increase the average strength if \( \bar{X} \) is less than the revised value of \( f'_{cr} \), and it is this part of the clause that can be misinterpreted as discussed later.

ACI 301 also requires a submittal for the revised mixture proportions for acceptance by the EOR before placing in the project.

Example

The following example illustrates some situations:

Assume that the specified strength for a project is 4000 psi.

The concrete producer has a strength test record for a similar class of concrete with a standard deviation of 550 psi.

Using equations 3 and 4, he establishes the required average strength for his proposed mixture at 4780 psi (rounded off).

During the project, the accumulation of 15 strength tests allows him to calculate his actual average strength and standard deviation. Assume that the actual average strength \( \bar{X} \) is 4800 psi and that both the acceptance criteria (Equations 1, and 2) are met.

Consider the following two situations:

i. Actual standard deviation = 350 psi.

The revised value of \( f'_{cr} \) (Equations 3 and 4) is determined to be 4470 psi. Since \( \bar{X} \) > revised \( f'_{cr} \) (4800 > 4470) he can reduce the average strength, \( f'_{cr} \), by about 350 psi.

ii. Actual standard deviation = 750 psi.

In this case the revised \( f'_{cr} \) is 5250 psi. Since \( \bar{X} \) < revised \( f'_{cr} \) (4800 < 5250) he should take steps to increase his average strength and reduce his risk of “failures.”
Misinterpretation - Revisions to Concrete Mixtures

In the author’s opinion, the first part of Clause (b) of article 4.2.3.6 of ACI 301-05 is subject to misinterpretation as was the case on one project.

The EOR required a calculation of the revised value of $f'_{cr}$ when each test result was received. The concrete producer was required to make revisions to his mixture proportions whenever the actual average strength $\bar{X}$ was found to be less than the revised $f'_{cr}$ and the revisions had to be submitted for acceptance before placement in the project. This caused needless project delays while significantly over designing the concrete (for strength) thereby resulting in higher cementitious materials content.

Effectively, on this project the EOR had imposed an additional “acceptance criteria” because the EOR assumed that the concrete “failed” the strength provisions any time the average drifted below the revised $f'_{cr}$, even by as much as 50 psi. To minimize these occurrences, the concrete producer had to design mixtures much higher than the traditional $f'_{cr}$ calculated according to Equations 3 to 6. The two strength acceptance criteria (Equations 1 and 2) are based on fundamental concepts and have served the industry well. Including additional overly conservative criteria should be avoided as they detract from the project goals.

It is a good idea that a concrete producer constantly monitors his strength test results (when he can get all of them) and make necessary revisions to mixtures when trending so suggests. It is also reasonable for the EOR as the owner’s representative to require this to occur so future strength problems and associated schedule problems are avoided. However, the requirement on this project was most likely not in line with the intent in ACI 301. The intent of ACI 301 Section 4.2.3.6 is to allow calculation of the revised value of $f'_{cr}$ at the start of the project as indicated by the statement “as soon as 15 consecutive compressive strength test results become available from the field.” This serves to validate the pre-construction submittal and assure the project team that strength problems will not crop up in the future. The interpretation that requires calculation of revised values of $f'_{cr}$ on a continual basis and increase average strengths if $\bar{X} < \text{revised } f'_{cr}$ goes beyond the intent of ACI 301, in the author’s opinion. However, the clause as written in ACI 301-05 does permit this misinterpretation. Therefore it is suggested that Clause (b) of article 4.2.3.6 of ACI 301-05 be revised to provide clarity.

References
1. ACI Committee 301, “Specifications for Structural Concrete (ACI 301-05),” American Concrete Institute, Farmington Hills, MI, 2005, 49 pp.
2. ACI Committee 318, “Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary,” ACI American Concrete Institute, Farmington Hills, MI, 2005, 465 pp.
For more information, contact Karthik Obla at 240/485-1163 or via email at kobla@nrmca.org.
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In these times of economic strife, companies are under tremendous pressure to cut costs where they can while continuing to provide a quality product and be competitive in the marketplace—a tall order by any standard. It may sometimes seem as though there is little companies may do to control their short-term outlook. However, investing in the training of employees to ensure that they are as knowledgeable and efficient as possible is one way to help your company weather the storm.

One of the greatest resources a company has is its professionals, and, during times of uncertainty, having the best performing staff will help your company gain an edge over the competition. This is true for all professionals within the concrete industry—from drivers who are the front-line representatives of the concrete industry and the supervisors who manage them, to dispatchers and concrete plant managers all the way to sales professionals—employees are the heart of any company. The RMC Research & Education Foundation has funded the development of a variety of educational and training resources for the concrete industry that will help your employees become the best that they can be.

One of the Foundation’s most recent additions to its deliverables is the development of The Effective RMC Supervisor Course, which was unveiled this year and is administered through the National Ready Mixed Concrete Association (NRMCA). Participants, many of whom started in the industry as drivers and were later promoted to a supervisor position, note that this course helped them to transition to their new responsibilities, especially under circumstances where they now supervise drivers with whom they were once peers. This vital training allows these new supervisors to better communicate with their direct reports, which ultimately increases job satisfaction for all involved. This is extremely important given that poor communication between drivers and supervisors is one of the most frequently-cited reasons that drivers leave the industry. Driver turnover is extremely costly and the RMC Research & Education Foundation Board of Trustees chose to fund the development of this course as a means to help the industry significantly decrease driver turnover and the associated costs.

When drivers are well-trained and knowledgeable, they are more effective and efficient in their jobs. As more drivers become certified in NRMCA’s Concrete Delivery Professional (CDP) certification program, the bar is raised for all drivers. The Foundation assisted in the effort to increase certifications through funding the development of training videos to accompany the CDP study modules. The Foundation also funded the translation of the CDP study modules into Spanish, along with the translation of NRMCA’s popular training publication, the “Truck Mixer Driver’s Manual” into Spanish. Since many new drivers to the industry come from Spanish-speaking communities, providing them with the oppor-
tunity to utilize Spanish-language training materials allows them to take full advantage of these vital industry tools.

Passing a certification exam demonstrates that a professional has a high-level of position-specific knowledge and skills to make a plant manager the best at his or her job. The Ready Mixed Concrete Plant Manager Certification Course is a particularly important training course that will ensure plant managers run their plant as effectively and efficiently as possible. There are few areas where costs savings may be found (or lost) through proper (or poor) plant management. The plant manager certification addresses several crucial areas, including product knowledge, environmental issues, safety, business principles and operational skills – all areas where a high level of knowledge on the part of a plant manager may result in significant cost savings.

Other training courses, such as the Financial Management Course for the Ready Mixed Concrete Industry and the Ready Mixed Concrete Sales Manager training course, offer ready mixed concrete professionals the opportunity to increase their skills in areas that may be deficient. The Financial Management Course is designed to teach participants who have moved up the ranks but who many not have a background in finance the basics such as reading and interpreting financial statements. Similarly, the Sales Manager course assists participants with learning how to manage projects and their sales team. Both courses help to augment the skills of professionals who gain new responsibilities during their careers in the ready mixed concrete industry.

Of course, drafting some of the industry’s top prospects upon graduating from one of the four Concrete Industry Management (CIM) programs nationwide allows the concrete industry to recruit new professionals who understand the nuances of the concrete industry and who can really hit the ground running. This is particularly important now as employers seek employees who offer a wide-breadth of skills and who can fill multiple roles as the economy remains tight. The RMC Research & Education Foundation has been a strong financial sponsor of the CIM program since its inception at Middle Tennessee State University and has continued its support as the program expanded to California State University-Chico, Arizona State University and the New Jersey Institute of Technology. The Foundation also looks forward to the launch of the latest program at Texas State in the spring of 2009.

Efficient. Effective. Multi-skilled. Well-trained. These traits are essential in ready mixed concrete industry professionals as the industry strives to stay competitive and weather the economic storm. Leaders within the concrete industry chose to establish the RMC Research & Education Foundation precisely to assist the industry with developing this asset and to improve the concrete industry. The more a company can count on its greatest asset – its employees – the more successful it will be. The RMC Research & Education will continue in its mission to support research and educational programs that will increase professionalism and quality in the concrete industry and, by doing so, will help to keep the industry on the cutting edge.

For more information on the projects and programs of the RMC Research & Education Foundation, please visit www.rmc-foundation.org.
Leading Your Workforce During an Economic Crisis

By Greg Smith

In the days and weeks since the economy began tanking, the workforce has been on an emotional roller coaster. Some people have fallen to terrible lows of fear, uncertainty and frustration. On and on it goes. While no one knows the outcome of our current situation, one fact is indisputable: the out-of-control emotions and the financial condition of our employees will have a tremendous impact on worker motivation, employee retention and productivity.

How can business leaders lead in the wake of this crisis? No two people will respond to these events in exactly the same way. Some may seem unaffected, others may exhibit out-of-the-ordinary behavior, and still others may react in dramatic ways. Actions business leaders take today can help improve productivity, maintain motivation and avoid a mass exodus of alienated employees when the economy turns around.

Managers have a critical role to play in these uncertain times; indeed, how managers treat their employees today will continue to resonate tomorrow. In offices across the United States, employees have been laid off while other businesses have closed their doors for good.

In times of crisis, communication is vital. One frustrated CFO accidentally blurted out to a few employees they were “lucky to have a job.” That one act did more to damage the morale and loyalty of the workforce than anything else.

Just as the United States is forming an economic plan to stabilize the economy, managers need a strategy for helping their companies get through the current crisis. I offer the following 10 steps—which are organized under the acronym TAKE CHARGE—for managing, motivating and leading your employees in a radically changed work environment.

T-Target fears and anxiety. People traverse through a span of emotions during crisis situations, beginning with concerns over their job security, their compensation and their ability to pay their bills. Announcements of job layoffs have exacerbated fear and anxiety. Managers should plan to address each of these concerns.

A-Accept the fact performance and productivity will drop. People respond differently in crisis situations. Expect to see people having difficulty concentrating, being forgetful, showing anger and displaying increased absenteeism—all normal responses. People will need to talk more, a natural aspect of dealing with this crisis. The more they talk the healthier the organization becomes. Expressions of concern and help with simple, daily tasks will go a long way to improve productivity.

K-Keep communication open. During times of crisis and uncertainty, business leaders tend to hold information—this will wreak havoc on the motivation of the workforce. Meet with staff members at all levels to express concern, as well as to promote available resources and other services. Obviously, people want to know about the security of their jobs and their compensation. Focus groups and town hall meetings can go a long way in helping people deal with the situation.

E-Educate managers and supervisors. Human resource professionals, managers and supervisors should be equipped with the resources, information and authority to assist employees. Training should include how to identify and help with stress as well as other
issues related to financial distress. Identify those most vulnerable and ask questions to determine how they are doing both at work and at home.

C-Calm, confident and reassuring leadership style. Don’t underestimate the importance of your personal leadership style. Displaying a calm and confident style of leadership can go a long way in maintaining stability and productivity. Managers should attempt to compartmentalize their own personal fears and concerns.

H-Help those in need first. Make no assumptions on how people feel or how they have been impacted by this crisis. While many will share their feelings, others will try to manage the burden by themselves. Recognize some individuals may need professional assistance—so ensure they understand how to access the employee assistance program (EAP).

A-Allow people to display their emotions. People are as diverse as their emotions and they display them in different ways. Allow them to express their feelings and emotions appropriately. One business has established a monthly gathering called the “Rumor Mill Meeting” where they address all the misinformation and rumors circulated that month.

R-Restrict negative behavior. A crisis brings out the best and worst of people. Make sure your performance management process addresses performance issues brought on by the financial crisis. Be aware and take appropriate actions to prevent theft. Make clear, in no uncertain terms that behavior of this sort will not be tolerated and will be dealt with accordingly.

G-Get people to embrace and support others. The success of any business is the people that work there. Similar to an act of terrorism, a financial crisis creates psychological damage on self-worth—it violates them and attempts to rob them of control over their life. Management’s role is to give control back to people. Interstate Battery Company is concerned about both the spiritual and emotional health of their workforce. Therefore, it has a fulltime chaplain to assist people with care and support.

E-Expect and plan for the long term. Unfortunately, this financial uncertainty is going to be with us for a long time to come. Insure you allow for activities to keep people motivated and engaged. Graham Weston, co-founder and CEO of the San Antonio based Rackspace Managed Hosting, finds this creative way to motivate employees and it has a big impact. Outstanding employees get the keys to the CEO’s BMW M3 convertible for a week. He says, “When someone gets to drive my car for a week, they never forget it.”

Applying these 10 steps is not only the right thing to do, it is the smart thing to do from a business standpoint. Do not abandon your employees. They will remember how you treated them during this highly emotional time. If you want your organization to be a place the best and the brightest will want to work in the future, you must be careful what you do in the here and now.

Greg Smith’s cutting-edge keynotes, consulting, and training programs have helped businesses reduce turnover, increase sales, hire better people and deliver better customer service. As President and founder of Chart Your Course International, Greg has implemented professional development programs for thousands of organizations globally. He has authored nine informative books, including 401 Proven Ways to Retain Your Best Employees. He lives in Conyers, Georgia. Sign up for his free Navigator Newsletter by visiting http://www.ChartCourse.com or call (770) 860-9464.

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1 2P188 – Truck Mixer Driver’s Manual  
– This manual educates truck mixer drivers about concrete and customer relations. This booklet also highlights driver duties, safety precautions, equipment inspection and maintenance procedures, and what the driver should do in case of an accident. This 64-page manual is easy to understand and contains common sense information every driver should know. Also available in Spanish – 2P188S; ($14 members, $54 non-members); (20 or more copies $12 ea. members, $54 ea. non-members.)

2 2PCPIP100 – Concrete In Practice Package  
– Concrete in Practice Sheets are short 1-page discussions on various concrete topics and are written in a “What? Why? And How” scheme intended to provide information on a non-technical format. The CIP topics are researched and written by members of NRMCA’s Research Engineering and Standards Committee. These are a great resource to give to your contractors and customers. English CIP Full Set 2PCPIP100 - contains 20 sets of each CIP topic 1-41. Spanish CIP Full Set 2PCPIP100es - contains 20 sets of each CIP topic 1-41. ($220 members, $320 non-members); English Single Set 2PCIPS & Spanish Single Set 2PCIPSes ($27 members, $110 non-members)

3 2PCPA – Concrete Pavement Analyst Software Version 3  
– NRMCA’s Concrete Pavement Analyst (CPA) is a powerful parking area concrete promotion design and costing software tool that quickly and accurately quantifies the differences between concrete and asphalt pavements. Using ACI and Asphalt Institute recommendations, CPA compares total ownership costs, providing specifiers the information they need to make sound pavement decisions. Features: A new asphalt cost calculator – allows for easy conversion of in-place square foot cost to in-place per ton cost; The ability to include aggregate subbase into concrete cost calculation to more accurately reflect real-life designs; Re-formatted, user-friendly reports are concise, easy-to-read; Updated default values for material and labor costs. ($25 members, $100 non-members)

4 2PHOS – Drivers’ Hours of Service Regulations Compliance Guide  
– Compliance guide for the federal drivers’ Hours of Service (HOS) regulations. Includes all aspects of the rule, including driving and on-duty time, log books, safety and labor issues, intrastate tolerance guidelines, scheduling guidance and frequently asked questions. Each guide also contains the official Code of Federal Regulations text of the HOS regulations and tolerance guidelines. ($65 members, $260 non-members)

5 2PGSTAR - Green-Star Program Templates  
- This binder includes easy to use Green-Star templates to help facilities establish a Green-Star program. There are also sample descriptions of Best Management Practices (BMP). Sample forms are included to help facilities organize the materials and training needed for an Environmental Management System. Also included are tools to complete the gap analysis along with templates for identifying environmental aspects and impacts and suggestions for setting environmental goals. ($100 members, $260 non-members)

6 2PLOTO – Lockout/Tagout/Tryout Program  
- This CD-based PowerPoint presentation and instructor notes illustrate the details of a company’s lockout/tagout/tryout program. The sources of hazardous energy at a ready mixed concrete facility are discussed. Lockout/tagout of the mixer drum is discussed along with a sample mixer drum lockout/ tagout procedure. Sample equipment specific lockout/ tagout forms are enclosed along with a sample LO/TO logbook and a LO/TO plan. Finally, a quiz and training documentation form is enclosed to help keep track of personnel training. ($82 members; $385 non-members)
7 2PBAC – Truck Mixer Backing Accident Prevention Program - This CD-based power-point presentation and instructor notes illustrates the causes of Truck Mixer backing accidents and the measures to take to prevent them. The kit also comes with training documentation forms, backing accident investigation form, standard truck mixer backing hand and arm signals (English and Spanish) and also handy reference cards that can be given to contractors at construction sites that assist in backing truck mixers. ($82 members, $385 non-members)

8 2PSD9 – Hand Signals for Mixer & Contractor Guides - Don’t compromise on safety, place one on every truck. 8” x 10” adhesive decal containing nine of the most common hand signals (Enter, Back In, Back Up, Pull Forward, Stop, Raise/Lower Chute, Start Pouring, More Water, Stop Pouring) with English and Spanish text. ($6 members, $10 non-members)

9 2PDIC – English-Spanish Translation Manual – Increase job site productivity and safety by improving your English-speaking truck mixer drivers, sales reps and field staff ability to communicate with Spanish-speakers. This concrete-specific, glove box-sized, English-to-Spanish booklet addresses communication challenges on the job site. It includes common words, photos and phrases, each with phonetic pronunciation, commonly used during a job site pour. 96 pages. ($14 members, $54 non-members); (20 or more copies $12 ea. members, $48 ea. non-members.)

10 2PRMDRV – Ready-Mix Drum Rescue Video - Performing maintenance inside a concrete-mixer drum is an often necessary task, but one which must be done with great care. Even so, there are risks, and if a rescue is necessary, the guidance this video offers can help assure a good outcome. What you will learn and see: Why a person would be in a mixer drum; Lock Out/Tag out; Confined space regulations; Personal Protective; Equipment; Proper Drum Chipping Procedures; Emergency Response Procedures; Two Simulated Rescuers; Various Types of Mixers and Usage. ($60 members and non-members)
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NRMCA, based in Silver Spring, MD, represents the producers of ready mixed concrete and the companies that provide materials, equipment and support to the industry. It conducts education, training, promotion, research, engineering, safety, environmental, technological, lobbying and regulatory programs.
Recently, I heard some stories about ready mixed concrete producers being sued because a few of their customers received cement burns from handling concrete without protection. What can I do to ensure I don’t receive cement burn complaints or get sued?

Homeowners and Do-It-Yourselfers do not always have adequate training and personal protective equipment (PPE) to protect themselves from cement burns. It is always best to seek advice from your in-house counsel (if one is on staff), or to consult an outside attorney familiar with the industry. However, the National Ready Mixed Concrete Association (NRMCA) has just finished its new “Cement Burn Awareness for Homeowners and Do-It-Yourselfers” brochure. The brochure describes for those “who may purchase, use or come in contact with wet (unhardened) concrete,” the dangers of handling concrete without protection, as well as the necessary steps to take to ensure safety while working with concrete. Dispatchers, Salesmen, Supervisors and Drivers should warn customers every chance they get to help keep cement burns from happening.

Please note: The column contained here should in no way be considered a substitute for competent legal counsel. It is only meant as a guide to help employers know when it is necessary to consult an attorney on issues pertaining to labor-management relations and other workplace issues.
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<table>
<thead>
<tr>
<th>Category</th>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADMXITURES</strong></td>
<td>BASF Construction Chemicals</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>The Euclid Chemical Company</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Fritz-Pak Corporation</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Xypex Chemical Corp</td>
<td>40</td>
</tr>
<tr>
<td><strong>AGGREGATES</strong></td>
<td>CEMEX USA</td>
<td>inside front cover</td>
</tr>
<tr>
<td><strong>BATCH PLANTS</strong></td>
<td>BMH Systems</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Merts, Inc.</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Plant Architects</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Stephens Manufacturing Co., Inc.</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>WAM Inc.</td>
<td>15</td>
</tr>
<tr>
<td><strong>CAMERA SYSTEMS FOR COLLISION AVOIDANCE</strong></td>
<td>INTEC Video Systems, Inc.</td>
<td>49</td>
</tr>
<tr>
<td><strong>CEMENT</strong></td>
<td>CEMEX USA</td>
<td>inside front cover</td>
</tr>
<tr>
<td></td>
<td>Holcim</td>
<td>3</td>
</tr>
<tr>
<td><strong>CEMENT SILOS</strong></td>
<td>Merts, Inc.</td>
<td>38</td>
</tr>
<tr>
<td><strong>CONCRETE</strong></td>
<td>Titan America</td>
<td>47</td>
</tr>
<tr>
<td><strong>CONCRETE BATCH MIXERS</strong></td>
<td>Schwing America, Inc.</td>
<td>26, 27</td>
</tr>
<tr>
<td><strong>CONCRETE BATCH PLANTS</strong></td>
<td>Erie Strayer Company</td>
<td>12</td>
</tr>
<tr>
<td><strong>CONCRETE CHIPPING</strong></td>
<td>Coast 2 Coast</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Jim’s Concrete Chipping Service, Inc.</td>
<td>47</td>
</tr>
<tr>
<td><strong>CONCRETE COLORANTS</strong></td>
<td>Davis Colors</td>
<td>34</td>
</tr>
<tr>
<td><strong>CONCRETE FIBER</strong></td>
<td>Buckeye Building Fibers LLC</td>
<td>47</td>
</tr>
<tr>
<td><strong>CONCRETE FIBER REINFORCEMENT</strong></td>
<td>Buckeye Building Fibers LLC</td>
<td>47</td>
</tr>
<tr>
<td><strong>CONCRETE MIXERS</strong></td>
<td>Elkin Manufacturing Inc</td>
<td>20</td>
</tr>
<tr>
<td><strong>CONCRETE PUMPS &amp; PLACING BOOMS</strong></td>
<td>Schwing America, Inc.</td>
<td>26, 27</td>
</tr>
<tr>
<td><strong>CONCRETE RECYCLERS</strong></td>
<td>Schwing America, Inc.</td>
<td>26, 27</td>
</tr>
<tr>
<td><strong>CONVEYORS</strong></td>
<td>Merts, Inc.</td>
<td>38</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL</strong></td>
<td>Enviro-Port, Inc.</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Waste Crete Systems</td>
<td>48</td>
</tr>
<tr>
<td><strong>FIBER REINFORCEMENT</strong></td>
<td>Buckeye Building Fibers LLC</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>New Nycon, Inc.</td>
<td>49</td>
</tr>
<tr>
<td><strong>FLY ASH</strong></td>
<td>Headwaters Resources</td>
<td>45</td>
</tr>
<tr>
<td><strong>HIGH PERFORMANCE CONCRETE</strong></td>
<td>Northeast Solite Corp</td>
<td>46</td>
</tr>
<tr>
<td><strong>INSURANCE &amp; BONDING</strong></td>
<td>Allied North America</td>
<td>42</td>
</tr>
<tr>
<td><strong>INTERNAL CURING</strong></td>
<td>Northeast Solite Corp</td>
<td>46</td>
</tr>
<tr>
<td><strong>MANAGEMENT CONSULTING</strong></td>
<td>FMI Corporation</td>
<td>36</td>
</tr>
<tr>
<td><strong>MIXER TRUCKS</strong></td>
<td>Custom Truck &amp; Equipment, L.L.C.</td>
<td>outside back cover</td>
</tr>
<tr>
<td><strong>READY MIX PLANTS</strong></td>
<td>Merts, Inc.</td>
<td>38</td>
</tr>
<tr>
<td><strong>SCALES</strong></td>
<td>Vulcan On-Board Scales</td>
<td>48</td>
</tr>
<tr>
<td><strong>STEEL FIBERS</strong></td>
<td>Bekaert Corp.</td>
<td>18</td>
</tr>
<tr>
<td><strong>TESTING EQUIPMENT &amp; MATERIALS</strong></td>
<td>Humboldt Mfg., Company</td>
<td>50</td>
</tr>
<tr>
<td><strong>TRUCK MIXERS</strong></td>
<td>Beck Industrial</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Custom Truck &amp; Equipment, L.L.C.</td>
<td>outside back cover</td>
</tr>
<tr>
<td></td>
<td>Schwing America, Inc.</td>
<td>26, 27</td>
</tr>
<tr>
<td><strong>TRUCKS</strong></td>
<td>Custom Truck &amp; Equipment, L.L.C.</td>
<td>outside back cover</td>
</tr>
<tr>
<td><strong>VEHICLE TRACKING SYSTEMS</strong></td>
<td>Teletrac, Inc.</td>
<td>inside back cover</td>
</tr>
<tr>
<td><strong>VOLUMETRIC MIXERS</strong></td>
<td>Cementech</td>
<td>35</td>
</tr>
<tr>
<td><strong>WASHOUT EQUIPMENT</strong></td>
<td>Waste Crete Systems</td>
<td>48</td>
</tr>
<tr>
<td><strong>WATER HEATING EQUIPMENT</strong></td>
<td>Heatec, Inc.</td>
<td>33</td>
</tr>
<tr>
<td><strong>WORKERS’ COMPENSATION</strong></td>
<td>Allied North America</td>
<td>42</td>
</tr>
</tbody>
</table>

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Where, When, Why And How?

Teletrac Fleet Director® Gives You The Answers

Tried and trusted by thousands of fleets.

Know where your trucks are. When they arrived. When they left the jobsite. Why they were late or early and how the situation developed. With Teletrac Fleet Director, you always have the answers you need to boost productivity, control operating costs and improve customer service levels.

So why is Fleet Director ideal for ready-mix operations? It gives you enhanced, GPS-based real-time location and status information for every driver, every load. Plus real-time, 2-way wireless communications between drivers and dispatchers to maximize productivity and efficiency.

And when equipped with Teletrac’s Turn-By-Turn™ navigation module, drivers are never lost, driver-to-dispatcher “chatter” is eliminated and a much calmer, more efficient dispatch environment is created.

Plus, Fleet Director is easily integrated with other leading software packages such as AceCo, Command Alkon, Systech and Jonel Engineering.

Fleet Director lets you manage with facts. Using operating information collected by the Prism™ TM2 onboard data recorder/transmitter, Teletrac eClient® software provides a full range of reports. Reports that let you objectively measure driver and vehicle performance.

J-Bus-captured vehicle diagnostics and versatile sensors deliver additional value. For longer-haul operations, automated HOS and fuel tax reporting options help reduce expenses even more.

Discover why over 5,000 commercial fleets operate with Teletrac Fleet Director.

Start with a call and get your free ROI analysis. See for yourself what Fleet Director would do for your operation.

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Teletrac customers consistently report the following average improvements:

- 13% Fuel Savings
- 15% Overtime Savings
- 13% Fewer Wasted Miles
- 12% Reduction of Unauthorized Usage
- 12% Increase in Productivity

(Source: 2007 Teletrac Customer Survey)

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2009 Peterbilt 340 w/ Terex 10.5yd Mixer
PX8 330 Hp; 9LL; 20,000lbs Front Suspension; 46,000lbs Haulmax Rear Suspension; Full Locking Differential.
Mixer Standard features include: 150 gal, 120 psi aluminum water tanks, Brinell skin & fins & flight, under 12’ hopper height, air chute bake and air flip hopper, slump meter, tow loop, work lights, electronic controls.
Units with Pre-2007 Engine Emissions Available

2007 Peterbilt 357 w/ Terex 11yd Bridgemax Mixer
Cat 350; 9LL; 20,000lbs Front Suspension;
46,000lbs Haulmax Rear Suspension; Full Locking Differential.
Mixer Standard features include: 150 gal, 120 psi aluminum water tanks, Brinell skin & fins & flight, under 12’ hopper height, air chute bake and air flip hopper, slump meter, tow loop, work lights, electronic controls.
Units with Pre-2007 Engine Emissions Available

2007 Sterling LT9511 w/ Terex 11yd Bridgemax Mixer
MBE 4000 370/450hp; 9LL; 20,000lbs Front Suspension;
46,000lbs Haulmax Rear Suspension; Full Locking Differential
Mixer Standard features include: 150 gal, 120 psi aluminum water tanks, Brinell skin & fins & flight, under 12’ hopper height, air chute bake and air flip hopper, slump meter, tow loop, work lights, electronic controls.
Units with Pre-2007 Engine Emissions Available

2007 Freightliner M2-112 w/ Terex 10.5yd Mixer
C13 Cat 335hp 1550 ft lbs of Torque; Allison Automatic; 20,000lbs Front Suspension;
46,000lbs Haulmax Rear Suspension; Full Locking Differential.
Mixer Standard features include: 150 gal, 120 psi aluminum water tanks, Brinell skin & fins & flight, under 12’ hopper height, air chute bake and air flip hopper, slump meter, tow loop, work lights, electronic controls.
Units with Pre-2007 Engine Emissions Available