The second case you listed in your email was that of the Orange Sun (http://www.ntsb.gov/publictn/2009/MAR0903.pdf). I can't see that squat was a factor here either.

I had not read this report before. I hope I can privately say that it was not altogether what it should be. The investigation ignored several contributing factors to the accident and misinterpreted other pieces of evidence:

1. Why did the ship take a sheer in the first place? Was there a design flaw that could be identified? Most ships are directionally stable. Slowing down does not cause them to run off to port or starboard of their own accord. What was special about this ship? This is the one item in the two reports that might be affected by inaccurate math models or simulators if they were used to test the maneuvering performance of the ship.
2. The helmsman, a major factor in the accident, was probably suffering from fatigue due to lack of sleep. His work schedule is part of the report, but no notice is taken of it.
3. The wild back and forth movement of the rudder is similar to what I described in my previous email as typical of NFU mistakes in a stressful situation. In this case mistakes by a fatigued helmsman and then by a captain trying to steer and multi-task.
4. The large console in the center of the bridge acted as a substantial obstacle that prevented the pilot or captain from simply reaching over and taking control away from the helmsman when it became apparent that he was frozen in confusion. There needs to be some recognition that these consoles contribute to accidents by blocking passage between the windows where conning is done and the navigation equipment.*
5. It appears from the photos that the rudder angle indicator was located where it would be directly over the pilot's head on the ceiling when he is standing in the usual conning position. This would make it awkward for him to check the rudder position without considerable contortion. The helmsman's error might have been more easily caught and corrected had the instrument been properly located on the wall in front of the conning station.
6. Part of the failure of the bridge team to discover the helmsman's mistake early was attributed to the mate's inattention to his duty to ensure the helmsman correctly executed the pilot's rudder orders. I agree that this is an important duty of the mate, but in the last five years or so I have seen the mates on watch occupied more often with nonsense tasks that leave them little opportunity to monitor the helmsman or to have any real sense of situational awareness. Specifically it is common now for the mates to be required to log the passing of every buoy in the channel. In Houston we have 45 pairs of buoys in 32 miles across the bay. This means that every three minutes or so the mate is going out to the bridge wing, getting the number of the buoy with binoculars and recording it – even on vessels with recording GPS devices. He is not really part of the bridge team and at night his constant trips back to the chartroom, opening and closing the curtain adversely effect everyone's night vision. What were the mate's actual duties on the Orange Sun and could he realistically have been expected to monitor the helmsman properly?
7. On p. 17 the report gives a paragraph to CP propellers including the following: "*Because of the ability to adjust the pitch, or angle, of the propeller blades, controllable pitch propellers enable quicker changes in ship speed and direction than do conventional propellers. This is an advantage over conventional propellers which alter speed by changing the revolutions per minute (RPM) of the propeller shaft. Controllable pitch propellers are especially advantageous in port or in confined waterways."* Nothing could be further from the truth. CP propellers are notorious for two things: loss of steering when reducing speed (exactly what happened in this case) and significant lack of astern power (possibly a contributing factor). The CP propeller's continuous rotation causes water flow over the rudder to be turbulent, reduced and/or blocked when the speed through the water is greater than the speed the propeller is attempting to drive the ship. Half ahead on the Orange Sun was 12.7 knots, dead slow was 5.2 knots. The ship was making between 8 and ten knots just before the collision which is a much higher speed than the propeller was trying to provide at the dead slow position. The rudder was getting froth to steer with.
8. In the final moments before the collision the pilot ordered full astern. The VDR shows the rudder moving from hard starboard to hard port and staying there while the engine is going astern. When backing a ship with a conventional rudder it is good practice to put the rudder amidships, but not critical. It perhaps makes a 10% difference in backing power. With a Becker or Schiller rudder the backing power of the propeller is reduced by more than half if the rudder is left hard over. It is a significant feature of Becker/Shilling high efficiency rudders and has been demonstrated conclusively in

manned ship model schools we attend. It is not a widely publicized item and many ship captains are unaware of this drastic reduction in backing power. It is something your investigators should be familiar with. This is not mentioned in the report.

9. In item five of the findings we find the following "*Although the pilot's order of starboard 10 for a 5° course change may have been excessive on a ship with a flap-type rudder…* ". While it is true that course changes on ships with Becker rudders can be made with less rudder than with a conventional rudder ***in normal operations***, in this case the propeller pitch had been substantially reduced. Ten degrees was far from excessive; twenty degrees and hard over is sometimes quite prudent in this condition. A good example is given in the account of the sheer taken by the ship on her inbound trip which the pilot corrected by hard over rudder, increased pitch and tugboat engagement – all applied simultaneously to control the sheer.
10. From p. 27 "*Neither [the pilot] nor the master sounded the juice carrier's whistle, which they were not required to do..."* This is an unusual statement. The danger signal is mandatory in situations like this and mariners have been cited for not sounding it. Having said that, I am not a fan of blowing the danger signal if all parties to the impending collision are aware of the situation by radio or other means. I say this because communications between the bridge and the anchor team on the bow are vitally important. The danger signal can take a long time to sound and the effect is deafening. While it is being sounded no communication with the forecastle is possible. Orders to drop anchors and how much chain to let out are much more important than the sounding of a (possibly) redundant whistle signal. Anyone who has seen/listened to the video** of the Bright Field when she hit the riverwalk in New Orleans can understand why orders to drop her anchors were not carried out effectively.
11. The conclusion of the report was that the probable cause of the accident was "*the master's failure to appropriately use bridge resource management and to communicate; specifically, to familiarize his bridge crew with and inform the pilot of the vessel's occasional tendency to sheer*". The pilot was a 57 year old experienced pilot. Pilots learn this lesson in the first few weeks of their apprenticeship. This "cause" is akin to holding a car salesman responsible because he didn't inform a mature buyer that their new car might skid on a wet highway if the brakes are applied forcefully.

Most of this is outside the scope of our original correspondence. I was just unable in good conscience to let all the above pass without note. I write in a spirit of working together to improve accident reporting which will hopefully improve safety for all of us.

Regards,

Lou Vest
Houston Pilot