



CONSTRUCTION
INDUSTRY RESEARCH
AND POLICY CENTER
VOL. 3 NO. 1

Construction Fatality Digest



JANUARY — MARCH 2014

QUARTERLY REPORT

Topics of Interest:

- **Fatality Case File Statistics**
- **Case File Regional Report**
- **Top Standards Violated**
- **Summary of Fatal Events**
- **Roofing Phone App**

INSIDE THIS ISSUE:

- NAICS Break-down** 2
- Regional Break-down** 2
- Cited Violations** 3
- Trends in Fatalities** 3
- Summary of Events** 4



The National “Campaign to Prevent Falls” Targets This Quarter’s Leading Cause

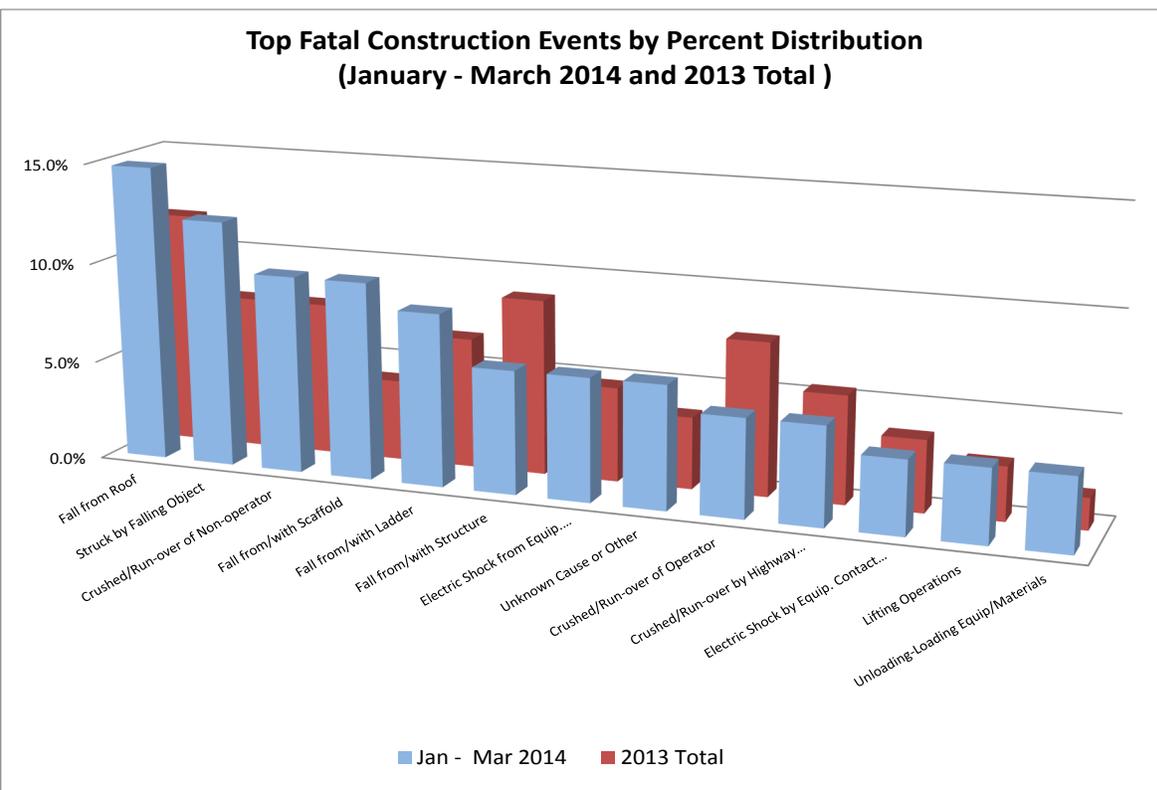
“Fall from Roof” led all fatal construction events reported to CIRPC for the first quarter of 2014. Of the 81 fatal events reported for the January to March period, “Fall from Roof” accounted for 14.8% (12 events) of the total. Rounding out the leading fatality causes for the quarter are “Struck by Falling Object/Projectile” at 12.3% (10 events) followed by “Crushed/Run-over of Non-operator” and “Fall from/with Scaffold” each with 9.9% (8 events), and “Fall from/with Structure” with 8.6% (7 events).

All types of falls (ladder, roof, vehicle, scaffold, bucket, structure, platform, and opening) accounted for 43.2% (35 events). For 2013, “Fall from Roof” were 11.7% (52 events) and all types of falls were 37.2% (165 events) of the total.

When comparing the ranking totals for 2013 with those for the current quarter, there is little variation. “Fall from/with Structure” decreased from 7.9% of the events to 6.2% and “Crushed/Run-over of Operator” decreased from 6.9% to 4.9%, where as “Fall from/with Scaffold” increased from 3.7% to 9.9%.

An alarming number of heart attacks (82) were reported for the year 2013, far exceeding the events for the year 2012 (30). This trend is continuing into 2014 with 33 heart attacks in the first quarter of 2014. It should also be noted, that heart attacks are not included in the 81 fatal events analyzed here.

**Top Fatal Construction Events by Percent Distribution
(January - March 2014 and 2013 Total)**



Regional Breakdown

“Of the 81 fatal events 69.1% (56 events) were in Federal OSHA states, while 30.9% (25 events) were in State Plan States.”

A total of 81 events were reported from the regions in the first quarter of 2014. Of these, a little more than 27% came from region 4 (22 events), 19 came from region 6, and 7 from regions 2, 5, and 9.

Of the 81 fatal events 69.1% (56 events) were in Federal OSHA states, while 30.9% (25 events) were in State Plan States.

The breakdown by state has Texas with the greatest number of events with 14 (17.3%), followed by Florida with 6 (7.4%), and North Carolina and New York both with 4 (4.9%).

Fatal Events by Region

January to March 2014		
Region	# of Cases	Percent
1	1	1.2%
2	7	8.6%
3	6	7.4%
4	22	27.2%
5	7	8.6%
6	19	23.5%
7	5	6.2%
8	3	3.7%
9	7	8.6%
10	4	4.9%
Total	81	100.0%

Fatal Events by NAICS Code

A breakdown of fatal events by NAICS code shows “Roofing Contractors” at the top with 13.6% (11 events) of the total 81 events. Other top codes are “Highway, Street, and Bridge Construction” contractors with 11.1% (9 events), “Electrical Contractors” with 9.9% (8 events), and “Site Preparation Contractors” with 8.6% (7 events.).

Fatal Events by NAICS Code

Code	Description	# of Cases	Percent
238160	Roofing Contractors	11	13.6%
237310	Highway, Street, and Bridge Construction	9	11.1%
238210	Electrical Contractors	8	9.9%
238910	Site Preparation Contractors	7	8.6%
238990	All Other Specialty Trade Contractors	6	7.4%
238220	Plumbing, Heating, and Air-Conditioning Contractors	6	7.4%
238310	Drywall and Insulation Contractors	5	6.2%
238120	Structural Steel and Precast Concrete Contractors	4	4.9%
238290	Other Building Equipment Contractors	3	3.7%
237130	Power and Communication Line and Related Structures Construction	3	3.7%
236220	Commercial and Institutional Building Construction	2	2.5%
237110	Water and Sewer Line and Related Structures Construction	2	2.5%
238110	Poured Concrete Foundation and Structure Contractors	2	2.5%
238170	Siding Contractors	2	2.5%
236115	New Single-Family Housing Construction	2	2.5%
238140	Masonry Contractors	2	2.5%
236210	Land Subdivision	2	2.5%
238320	Painting and Wall Covering Contractors	1	1.2%
238130	Framing Contractors	1	1.2%
238350	Finish Carpentry Contractors	1	1.2%
238340	Tile and Terrazzo Contractors	1	1.2%
237120	Oil and Gas Pipeline and Related Structures Construction	1	1.2%
		81	100.0%



Top Construction Standard Violations

Only 7 of the 81 cases examined by CIRPC in 2014 reported citations issued*. In the 7 cases there were 19 violations of OSHA standards. The average number of violations per case with citations issued was 2.71. The previous year's (CY2013) the average number of violations per case was 3.86.

The "Hazard Communication" standard is the top violated standard for the year to date with 3 occurrences. Fall Protection standards (training, equipment requirements, etc.) accounted for 5 violations of the 19 issued.

When comparing the running total of 2014 violations with OSHA's Top 10 standards violated in FY2013 (per www.osha.gov), there are similarities and differences. The top three of the most frequently violated OSHA standards are also be found on the quarterly report list ("Fall Protection", "Hazard Communication", and "Scaffolding").

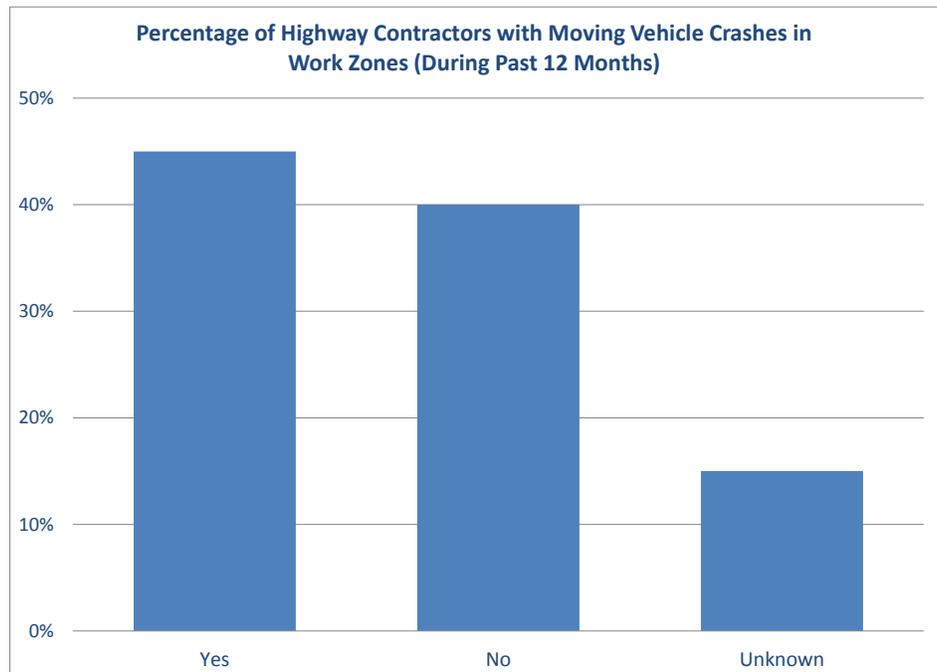
Top Standard Violations Reported During CY 2014

Rank	Std #	Description	# of Occurrences
1	1910.1200	Hazard Communication	3
T2	1926.20	General Safety & Health Provisions	2
T2	1926.21	Safety Training and Education	2
T2	1904.39	Reporting Fatalities & Multiple Hospitalization Incidents	2
T2	1926.502	Fall Protection Systems Criteria and Practices	2
T2	1926.501	Fall Protection	2
T3	5a1	General Duty Clause	1
T3	1926.451	Scaffolding	1
T3	1926.454	Scaffold Training	1
T3	1926.453	Aerial Lifts	1
T3	1926.503	Fall Protection Training	1
T3	1926.152	Flammable Liquids	1

* Inspectors have up to six months to issue citations on the finding of the fatal investigations.

Trends in Fatalities - Highway Road Work

A recent study by the Associated General Contractors of America revealed 45% of highway contractors experienced a motor vehicle crash into their work zones. Of the contractors with incidents, 26% of them reported 5 or more occurrences. Twenty percent of the incidents had at least one injury and/or fatality. These totals are alarming. Tom Case (of AGC of America) states it best, "There is little margin for error when you work within a few inches of thousands of fast-moving vehicles."



Summary of Fatal Events

Below is a selection of the fatal event summaries from the 81 cases reported for the quarter.

CATEGORY: ROOF FALLS

Inspection # - 879064

The owner of a roofing company was setting up safety cabling and preparing to cover the skylights with plywood on the roof of a commercial warehouse. He fell approximately 25 feet through a skylight to the floor below.

Inspection # - 317411221

The victim was unloading roofing material from a forklift onto a roof when he stepped onto a fluted deck, rolled his ankle, staggered back and fell over a one foot parapet wall 36 feet to the ground.

Inspection # - 317267888

An employee engaged in the reroofing of a residential structure fell approximately 20 feet to the ground below. The employee was not utilizing fall protection at the time of the fall.

Inspection # - 317635282

Construction worker was pulling roof membrane across the roof when he slipped on some frost and fell off the flat roof.

Inspection # - 317654887

The victim climbed onto the roof to inspect a section of roof. Employees in the area stated he had been up on the roof for about 5 minutes when workers in the manufacturing site saw or heard the victim hit the floor after falling through a translucent roof panel. The fall to the concrete floor was about 25 feet.

CATEGORY: STRUCK BY FALLING OBJECT/PROJECTILE

Inspection # - 317313898

An employee with 13 years of experience was attempting to remove the steel cap and steel ring coupling from a 10 inch pipe. The piping system had undergone a pressure test a couple months earlier and was still pressurized. The pressure release from the pipe caused the steel cap and steel ring coupling to hit the employee in the chin causing a blunt force injury resulting in a fatality.

Inspection # - 317605905

Victim was standing on a scaffold approximately 12' high installing a 14'x12' industrial garage door while a co-worker stood on the ground holding onto the bottom of the door. The victim tightened the springs for the door to retract and then took the vice grips off of the connecting shaft. The co-worker attempted to raise the door to make sure it was in working order. The top panel of the door stuck on the top of the door frame. The co-worker loosed the hinges from the door to the frame in an attempt to clear the panel from the frame. The door abruptly flew up; the co-worker grabbed the door which lifted him 2' off the ground. He called back to the victim, who didn't answer. Co-worker looked behind him and saw him unresponsive on the ground.

Inspection # - 317361061

The employee was in the process of clearing trees on two lots at a modular home park. At the time of the accident, the victim was operating a backhoe and using it to push-down a tree when the tree snapped and fell on the cab of the backhoe crushing the victim.

Inspection # - 868988

An employee was moving a switch-gear that was on rollers onto a concrete slab. The switch-gear fell over causing the employee to be partially pinned underneath fatally injuring him.

Inspection # - 316922426

An employee was applying sheathing on the roof of a college dormitory building, when a sheet of 8' x 4' plywood was blown off the roof by the wind, striking the victim who was working on the ground level resulting in fatal bodily injuries.

Summary of Fatal Events (Continued)

CATEGORY: STRUCK BY FALLING OBJECT/PROJECTILE (Continued)

Inspection # - 877662

A timber feller/saw man was using a chain saw to clear trees. The tree he was working on was tangled with an adjacent tree. The tree top of the adjacent tree broke and fell onto the employee fatally injuring him.

Inspection # - 869357

Three workers who accessed the roof area to conduct an inspection, through an interior stairway, decided to use the building's exterior fire escape system to get to the ground. When the stairs got stuck in its descent, the victim moved to another area to bounce on the structure, to break it free. The cable portion of the system failed and the worker was struck by the cable. The victim died on site. The two remaining workers were not hurt.

CATEGORY: STRUCK BY, RUN OVER, CRUSHED BY OPERATING CONSTRUCTION EQUIPMENT/VEHICLE

Inspection # - 317618874

While constructing a modular block retaining wall, employee was shoveling gravel from the bucket of a skid steer loader and positioning the blocks. When the skid steer operator backed the loader up an incline with the lift arms raised the loader tipped forward striking employee in the head.

Inspection # - 875901

The victim jumped from back of truck while performing litter control duties. The driver backed up the truck and struck the victim.

Inspection # - 317585545

Victim and a co-worker were in the basket of an aerial lift. They were removing bolts from the top edge of the easternmost concrete bulb tee beam that used to support a catwalk along the eastern edge of the bridge. The victim was operating the controls of the aerial lift and was facing the control panel and had his back to the bridge. At some point, the victim was extending the boom of the aerial lift and he was caught between the bottom of the beam and the control panel of the aerial lift and was crushed.

Inspection # - 316921758

A seven man crew was finishing setting up a construction zone. The crew was there to repair damaged guardrails along the westbound side of the roadway. The crew had placed alert signs in each direction of travel in preparation to stop all traffic prior to completely closing the westbound lane. Victim was the designated flagger stopping eastbound traffic. Victim entered the roadway attempting to stop traffic and was struck by an oncoming vehicle. Statements to the police indicated that the driver's vision was impaired by sunlight and did not notice victim.

Inspection # - 868596

An employee was parked on the side of the road and was standing at the back of his truck. An oncoming vehicle lost control and drove into the area of the parked truck, striking the employee and pinning him between the two vehicles.

Inspection # - 317513034

Victim was working on a repaving task, when the foreman instructed the victim to control/flag private vehicle traffic. While the victim was on his way, another employee was backing up a truck. The victim walked behind the truck and the other employee did not see him. The truck rolled over the victim fatally injuring him.

CATEGORY: OTHER FALL EVENTS

Inspection # - 876569

An employee was installing siding on a residential home from a 6-foot step ladder. The step ladder was positioned on loose rocks and the employee fell from the ladder striking his head against a stone surface.

Summary of Fatal Events (Continued)

CATEGORY: OTHER FALL EVENTS (Continued)

Inspection # - 316779792

The employee was working 49' above the lower level on a pump jack scaffold applying commercial siding to an apartment complex. According to the only witness, the employee unhooked his lanyard in order to lean out toward the building from the scaffold and install a soffit vent. The employee slipped and fell 49' to the concrete footer below.

Inspection # - 870319

Employees were preparing to work on the girder of a bridge that spanned a river. The employees planned to access the work area with the use of a hydraulic boom (cherry picker type) lift that was positioned on a barge. The employees were tethered to the boom of the lift. While the employees were over the water the lift became unstable and fell off the barge. Co-worker was able to free his line from the boom and was rescued. The victim remained attached to the boom and was fatally injured.

Inspection # - 870954

A cell tower collapsed while four employees were on the tower. Two of the employees suffered fatal injuries and the other two employees were injured and hospitalized. A fireman that responded to the site was struck and killed by a second tower that fell after sustaining damage when the first tower struck it.

Inspection # - 317667525

A carpenter was on an 8 foot step ladder to touch up paint on residential structure. He fell off the ladder and sustained serious bodily injuries. There were no witnesses to the accident.

Inspection # - 317249845

A 58 year old drywall installer was working alone taping drywall when he fell to the concrete floor from a rolling scaffold tower, approximately 12' 6" in height. There were no witnesses to the accident.

Inspection # - 867611

Two employees were working on a bridge using an aerial platform when the pin at the base of the turntable broke dropping the arm, platform and 2 employees on the platform to the ground below fatally injuring them.

Inspection # - 874073

Two linemen were going up a utility pole to remove the utility lines to run new lines. The victim had made it to the neutral line and was waiting for the co-worker to get to the neutral line. When the co-worker got to the neutral line, the two linemen heard the wooden pole start to crack at the base. When the pole broke below grade, the linemen were wearing their climbing belt around the pole. The linemen rode the broken pole down, the co-worker landed on victim who took the brunt of the impact. The victim was initially thought to be okay; he was observed walking around on site. The co-worker suffered a broken leg. In the emergency room, the victim's blood pressure dropped and then later passed away due to internal bleeding.

Inspection # - 875397

An employee was sitting on a x-brace of a bridge pulling on a rope connected to a scaffold attempting to move the scaffold to a new section of the bridge to be worked on. The employee lost his balance and fell backwards off the bridge.

Inspection # - 316961911

The victim was welding on a mast scaffold. When he was finished working in the area he unhooked his double lanyard. While transiting from the west end of scaffold, he tripped over the welder, according to witnesses, fell downwards feet first and hit the small welding platform and an extended part of the building called a "bump out." The employee fell 75' 6" to the asphalt surface.

Summary of Fatal Events (Continued)

CATEGORY: ELECTROCUTIONS

Inspection # - 872850

The driver of a large dump truck elevated the dump body to clean snow out of the dump bed and contacted an overhead transmission line. He exited the cab and began walking to the rear of the vehicle and came in contact with the truck and was shocked. The owner of the company returned to the office/yard and observed the cab tire on fire. He pulled up next to the truck and was attempting to extinguish the fire and touched a rod on the front of the cab and was shocked. Both were taken to the hospital where they were pronounced dead from their injuries.

Inspection # - 873680

A lineman was transferring power from old power lines to new power lines from the bucket of an easement machine. The employee was fatally electrocuted when he contacted live 7200 volt overhead power distribution lines with both (gloved) hands.

Inspection # - 878963

Victim was raising the mast of a water well drilling rig when the mast made contact with overhead power lines.

Inspection # - 879052

Employee was repairing lighting ballast located inside the attic crawl space. The power to the exterior lighting was bypassed at the electrical breaker due to the system being on a timed delay. During the process of repairing the ballast, the employee contacted the live electrical wiring and was electrocuted.

Inspection # - 871508

An employee was repairing a blown transformer at a recreational area. The employee was told that spare parts could be obtained from an out of service transformer nearby. Employee attempted to obtain spare parts and was electrocuted. Spare transformer was still in service.

CATEGORY: OTHER FATALITY CAUSES

Inspection # - 873812

Employee at a septic treatment plant was holding a tag line that was attached to a tank that was being unloaded from a truck. The truck mounted crane that was unloading the tank collapsed when the bolts that attached the crane to the truck failed.

Inspection # - 876613

An employee was unloading pipes off a truck trailer when pipes rolled off the trailer and struck him. The employee had been unstrapping the pipes when the fatal injury occurred.

Inspection # - 317618106

An employee was near the passenger side of a flatbed trailer toward the front when a 45 foot long, 8,000 lb section of pipe-manifold that had come from the dismantling of a geothermal power plant rolled off the trailer, crushing him. The pipe-manifold assembly on the trailer had been bumped by a co-worker operating a rough terrain fork lift, from the opposite side of the trailer, causing the pipe-manifold assembly to roll off the passenger side.

Note: These narratives are taken directly, with only minor editing, from the reports filed by the CSHO's.



Roofing Safety is NO ACCIDENT - New Roofing Phone App

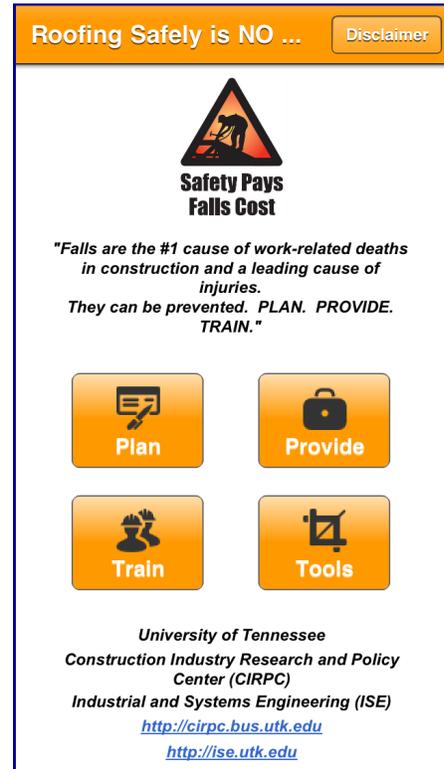
Recently CIRPC noted two OSHA citations against a Midwest roofing company for exposing workers to fall hazards on a residential site. Unfortunately this is not an isolated incident. In a recent article in the Journal of Safety Research, 44 (2013) 17–24, *Fatal Falls from Roofs Among U.S. Construction Workers*, Dong, Choi, et al. note:

“Falls from roofs occur more frequently than other types of falls, particularly among roofers. Sa, Seo, and Choi (2009) surveyed residential and commercial roofers in the Midwest and found that compared with commercial roofers, residential roofers experienced more injuries due to falls and were less likely to be provided with fall protection devices or have their use enforced by their employers.”

As part of our mission, the Construction Industry Research and Policy Center (CIRPC) at the University of Tennessee attempts to raise safety awareness and disseminate tools and information to achieve best safety practices. We have recently developed an application for tablets and smartphones titled *Roofing Safety Is NO ACCIDENT* available for download on iTunes and Google Play without charge.

The app allows users to determine the OSHA permissible fall protection systems for residential roofing sites based upon roof slope and other criteria. It also provides a tool to estimate roof areas and provides OSHA contact information in case of imminent danger. We believe this tool can raise safety awareness and help prevent roof falls. It is now available in English with a Spanish version coming soon.

Help us spread the word - *Roofing Safety is NO ACCIDENT*.



Pictured above is a screen capture of the home page of the mobile phone app.



PLAN . PROVIDE . TRAIN .

Three simple steps to preventing falls.

We can be contacted at:

Construction Industry Research and Policy Center
 The University of Tennessee
 Stokely Management Center, Room 202
 916 Volunteer Boulevard
 Knoxville, Tennessee 37996
 Phone: 865-974-4422
 E-mail: cirpc@utk.edu

CIRPC



If you'd like to subscribe to this digest, please go to <http://cirpc.bus.utk.edu/Digest.asp> and click "Subscribe."